

Research Article

Using Telegraphic Input With Children With Language Delays: A Survey of Speech-Language Pathologists' Practices and Perspectives

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Purpose: Speech-language pathologists (SLPs) often simplify their language input when talking to young children with language delays, but there is some controversy regarding whether simplified input should be telegraphic (e.g., *Ball under, Doggie go, More toy*) or grammatical (e.g., *The ball went under; Go, Doggie! More toys*). The purpose of this study was to evaluate SLPs' practices and perspectives on using telegraphic input when working with children with language delays at the prelinguistic, one-word, or two-word stages of spoken language development.

Method: Practicing SLPs were recruited from a university-sponsored professional development conference focused on current best practices in speech-language pathology. Respondents completed an online survey that included questions about their own practices, as well as their overall perspectives on the usefulness of simplifying language input in different ways.

Results: The vast majority of SLPs (82%) reported using telegraphic input. SLPs reported using telegraphic input more frequently when prompting for verbal imitations than when describing play or providing a directive/request. Surprisingly, only 30% of SLPs who reported using telegraphic input felt that it was useful. SLPs reported that receptive language is the most important child characteristic to consider when deciding what kind of language input to provide.

Conclusions: These findings suggest the need for more purposeful clinical decision making in the context of providing simplified language input. In addition, in-depth, qualitative studies are needed to characterize the complex interactions among beliefs, experiences, practices, and perspectives pertaining to simplified language input.

When working with children with language delays, speech-language pathologists (SLPs) often simplify the language they produce relative to the utterances they use in everyday adult conversation. Although using simplified input is a common practice among SLPs, there has been some controversy regarding the most effective way for us to simplify our utterances, particularly when working with children at the prelinguistic, one-word, or two-word stages of spoken language development (Bredin-Oja & Fey, 2014; Sandbank & Yoder, 2016; van Kleeck et al., 2010; Venker et al., 2015; Wolfe & Heilmann, 2010).

This controversy has primarily centered on whether simplified utterances should be telegraphic, or whether they should maintain the grammatical rules of English. Telegraphic utterances contain content words (e.g., nouns, verbs) but eliminate function words (e.g., articles, auxiliaries)—similar to young children's productions during the early stages of language development (e.g., *Ball under, Doggie go, More toy*). In contrast, simplified, grammatical utterances maintain the grammatical rules of English (e.g., *The ball went under; Go, Doggie! More toys*; Bredin-Oja & Fey, 2014; van Kleeck et al., 2010).

Over the past several decades, clinical recommendations have been made in support of both telegraphic input (e.g., Willer, 1974; some clinical viewpoints presented in van Kleeck et al., 2010) and grammatical input (Bedore & Leonard, 1995; Conklin, 2010; Eisenberg, 2014; Fey, 2008; Kamhi, 2014; Paul, Norbury, & Gosse, 2018). The general rationale on both sides of this debate has been that the specified type of input (i.e., telegraphic or grammatical) is more beneficial for children with language delays. Historically,

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there has been little scientific evidence regarding the potential benefits of telegraphic versus grammatical input, which has posed a considerable barrier to implementing evidence-based practice. Though evidence from clinical studies remains limited, several recent studies (Bredin-Oja & Fey, 2014; Sandbank & Yoder, 2016; Venker et al., 2015) have suggested that grammatical input may offer some advantages over telegraphic input. Despite the growing empirical attention to this issue of telegraphic versus grammatical input, we know very little about how practicing SLPs simplify their language input and why. As a first step in addressing this issue, the current study surveyed practicing SLPs about their practices and perspectives on using telegraphic input when working with children with language delays. Here, we outline the theoretical rationale and empirical evidence both for and against telegraphic input in relation to several different aspects of language: producing verbal imitations, understanding spoken language, identifying word categories, learning words, and learning grammar.

Producing Verbal Imitations

One of the most common theoretical arguments made in support of telegraphic input is that telegraphic models should be easier for children to verbally imitate than grammatical models (van Kleeck et al., 2010; Willer, 1974). Despite the popularity of this claim, there appears to be little scientific evidence to support it. Willer (1974) conducted a treatment study of 10 children with moderate intellectual disabilities between 5 and 13 years old. In this study, half of the children were presented with telegraphic (reduced) imitation models (e.g., *Ball*, *Boy running*, *Ball on table*), and the other half were presented with grammatical (non reduced) models (e.g., *This is a ball*; *The boy is running*; *The ball is on the table*). Children presented with reduced models showed better verbal imitation than children presented with grammatical models, which has led some to interpret it as providing support for telegraphic imitation prompts (Bredin-Oja & Fey, 2014; Conklin, 2010; Fey, 2008; van Kleeck et al., 2010; Venker et al., 2015). However, this study incorporates a methodological confound that renders its results difficult to interpret. The grammaticality of the adult models was confounded with length, such that telegraphic utterances were always shorter than grammatical utterances. For this reason, the findings of this study cannot speak to the impact of telegraphic versus grammatical input, independent of utterance length (also see Shipley, Smith, & Gleitman, 1969; Wolfe & Heilmann, 2010).

Recent empirical evidence suggests that grammatical input may also offer advantages over telegraphic input when prompting children with language delay to produce verbal imitations. Bredin-Oja and Fey (2014) examined the effects of telegraphic versus grammatical imitation prompts on five children with language delay. Children were equally likely to imitate both types of prompts, showing that the use of the more complex grammatical prompts did not discourage the children from attempting to imitate adult models. Moreover, three of the five children produced more grammatical

morphemes when presented with grammatical prompts than with telegraphic prompts. The other two children did not produce any grammatical morphemes following either type of prompt. These findings led the authors to conclude that grammatical prompts are a more advantageous treatment strategy because they allow children to produce grammatically complete utterances when they are developmentally ready.

Understanding Spoken Language

Another theoretical argument made in support of telegraphic input is that, because telegraphic utterances include content words but eliminate function words, they are easier to understand than grammatical utterances for children with language delays (van Kleeck et al., 2010; Willer, 1974; Wolfe & Heilmann, 2010). Although this argument is reasonable, to our knowledge, there is no scientific evidence to support it. In fact, studies of children with typical development provide evidence to the contrary—that grammatical input is easier for children to understand than telegraphic input. In a study of 11-month-old French-learning infants with typical development, Hallé, Durand, and de Boysson-Bardies (2008) found that the presence of articles helped infants recognize subsequent words. Similarly, Kedar, Casasola, Lust, and Parmet (2017) found that grammatical utterances elicited faster processing in 12- and 18-month-olds with typical development than telegraphic utterances did (also see Fernald & Hurtado, 2006). These findings indicate that utterances containing more information are not necessarily more difficult to process than those containing less information. In addition, this evidence illustrates that function words support language processing in infants and young children even at a point in development when they are not yet producing these function words themselves. Thus, production of a particular feature of language is not a prerequisite to using this feature during language processing.

Identifying Word Categories

Bedore and Leonard (1995) suggested that grammatical input supports children's learning of word categories through a phenomenon known as prosodic bootstrapping. The theoretical rationale is that prosodic patterns in grammatical input, such as the presence of weak versus strong syllables, may help children make inferences about new words they encounter. In grammatical input, content words often correspond to strong syllables, whereas function words typically correspond to weak syllables, which may help children to identify word categories. In telegraphic input, however, weak syllables (e.g., the second syllable of *baby*) correspond only to content words, which may subsequently make it more difficult for children to recognize word categories on the basis of stress. In addition, Bedore and Leonard suggested that children who hear telegraphic input may have a particularly difficult time learning function words in general. Though we are not aware of any studies of children that directly support this claim, Morgan, Meier, and

Table 1. Demographic parameters.

Demographic parameter	Category responses	Response count	Response percentage	Total number of respondents
Race	American Indian or Alaska native	0	0%	<i>n</i> = 88
	Asian	0	0%	
	Black or African American	5	6%	
	White	82	93%	
	Native Hawaiian or Other Pacific islander	0	0%	
	More than one race	1	1%	
Ethnicity	Hispanic or Latino	2	2%	<i>n</i> = 89
	Not Hispanic or Latino	87	98%	
Highest degree obtained	Bachelor's degree	1	1%	<i>n</i> = 92
	Master's degree	87	95%	
	Ph.D.	4	4%	
Years of total experience	0–5 years	29	32%	<i>n</i> = 90
	6–10 years	17	19%	
	11–20 years	27	30%	
	21+ years	17	19%	
Years of school-based experience	0–5 years	39	46%	<i>n</i> = 84
	6–10 years	15	18%	
	11–20 years	19	23%	
	21+ years	11	13%	
Age groups represented on caseload (respondents could select multiple age groups)	Birth to age 3 years	17	18%	<i>n</i> = 93
	Age 3 to 5 years	70	75%	
	Elementary school	78	84%	
	Middle school	36	39%	
	High school	24	26%	

Note. The total number of respondents was 93. Respondents were given the option to select more than one race. For the question about age groups represented on caseload, respondents were given the option to select multiple age groups. Ph.D. = doctor of philosophy.

Newport (1987) found that prosodic cues were critical in allowing adults to learn the syntax of an artificial language.

Learning Words

The presence of syntactic cues in grammatical input, such as function words (e.g., articles) and grammatical morphemes (e.g., plural *-s*), may also help children learn the meanings of new words (Fisher, Gertner, Scott, & Yuan, 2010; Gleitman, 1990; Lany & Saffran, 2010; Naigles, 1996). Many studies have focused on children with typical development, but children with language delays, autism spectrum disorder, and developmental delay are also capable of syntactic bootstrapping (Cleave, Kay-Raining Bird, Trudeau, & Sutton, 2014; O'Hara & Johnston, 1997; Shulman & Guberman, 2007). For example, three-year-olds with autism spectrum disorder can use syntactic features of utterances to infer the meaning of novel verbs (Naigles, Kelty, Jaffery, & Fein, 2011). Although syntactic features of grammatical input can support word learning, children cannot use these cues if the cues are not provided. For this reason, it has been argued that, instead of supporting word learning, telegraphic input may actually put children at a further disadvantage (Eisenberg, 2014; Fey, 2008).

Learning Grammar

A final point to consider is that, by definition, telegraphic input limits children's exposure to correct grammar. This limited exposure is potentially problematic because, as

a general rule, children with language delays or impairments require increased exposure to language in order to learn effectively (Eisenberg, 2014; Gray, 2003). Thus, fewer exposures to grammatical markers and function words may make language learning even more challenging for these children (Eisenberg, 2014), potentially explaining why higher rates of parent telegraphic input are associated with weaker language outcomes in children with autism spectrum disorder over time (Venker et al., 2015; also see Sandbank & Yoder, 2016). Fey (2008) also suggested that prolonged exposure to telegraphic input may extend the period in which children with language impairment exhibit difficulty in learning obligatory grammatical markers and may lead children to interpret telegraphic models as acceptable variations of adult language. In addition, children who are exposed to grammatical and telegraphic input receive inconsistent information about the grammatical structure of English, which could limit their learning even further (Eisenberg, 2014; Fey, Long, & Finestack, 2003).

Evolving Clinical Recommendations

Although theoretical arguments can be made in support of either telegraphic or simplified grammatical input, the growing empirical evidence in support of grammatical input (Bredin-Oja & Fey, 2014; Sandbank & Yoder, 2016; Venker et al., 2015) has led some clinical research experts to explicitly recommend that clinicians use input that maintains the grammatical rules of English (Conklin, 2010; Eisenberg, 2014; Fey, 2008; Fey et al., 2003; Kaiser & Hampton, 2017;

Kamhi, 2014; Paul et al., 2018; van Kleeck et al., 2010). For example, Eisenberg (2014) stated that “The research evidence does not support telegraphic input but rather suggests that we should produce grammatical morphemes when we talk to children” (p. 121). Paul et al. (2018) made a comparable recommendation, stating that “...whatever [intervention] approach we use, the linguistic input ought to be complete and well-formed” (p. 268). These recommendations are consistent with recommendations from other clinical research teams who have advocated for grammatical input on a theoretical basis for some time (Bedore & Leonard, 1995; Fey et al., 2003).

In addition to published clinical recommendations, intervention approaches have made recommendations regarding the type of input that should be provided. Some intervention approaches advocate for the use of telegraphic input alongside grammatical input (e.g., Ingersoll & Dvortcsak, 2010; Rogers, Dawson, & Vismara, 2012). For example, the Early Start Denver Model, a comprehensive intervention for young children with autism spectrum disorder (Rogers et al., 2012), recommends the use of phrases such as, *Want bunny? More ball; Cow, put in; [Child] wants swing!; and Give me diaper*. Similarly, Project ImPACT, a parent-mediated intervention focused on improving young children’s social communication skills (Ingersoll & Dvortcsak, 2010), states that, “In some cases, it is appropriate to simplify your language by leaving out higher-level parts of language (e.g., “Feed baby” instead of “You are feeding the baby...”; Ingersoll & Dvortcsak, 2010, p. 40). Both interventions are well supported by both theory and empirical evidence (Dawson et al., 2010; Ingersoll & Wainer, 2013; Stadnick, Stahmer, & Brookman-Frazee, 2015; Vivanti et al., 2014; Waddington, van der Meer, & Sigafos, 2016), but it remains possible that the effectiveness of these interventions in supporting language development could increase if telegraphic input were minimized and grammatical input maximized. It is also interesting to consider whether parents would find it more natural to learn to use simplified, grammatical utterances, rather than telegraphic utterances (Paul et al., 2018).

Interestingly, several intervention approaches that previously incorporated telegraphic input now recommend the use of simplified, grammatical input. For example, programs developed by the Hanen Centre formerly suggested the use of telegraphic input, but now teach parents to use utterances that are short and grammatical (Conklin, 2010). Milieu teaching approaches have also evolved, as described by Kaiser and Hampton (2017):

“Although early versions of [milieu teaching] and [responsive interaction] utilized telegraphic speech to model target-level language for children, [enhanced milieu teaching] has evolved away from modeling the less natural, grammatically incomplete forms. Thus, although a target phrase may include only two words, the parent or clinician is encouraged to retain all articles and appropriate grammatical markers so that the target represents a portion of a grammatically correct phrase or sentence. For example, ‘roll the

ball’ is preferable to simply ‘roll ball’ as part of the larger phrase ‘I roll the ball to you.’ In addition, the parent would retain grammatical morphemes by saying ‘the ball rolls’ rather than simply ‘ball roll’ (Bredin-Oja & Fey, 2014)” p. 103–104.

Many clinical recommendations have included not only which type of input should be used, but also for which children. In large part, previous recommendations have been based on children’s spoken (i.e., expressive) language abilities. For example, Miller recommended that “...the clinician input should initially be telegraphic, but as the child began to use syntactic constructions, the clinician should transition to using fully grammatical sentences when expanding and modeling utterances” (van Kleeck et al., 2010, p. 14). It has also been recommended that clinicians take cognitive ability into account, as children with intellectual abilities in the average range may not benefit from telegraphic input or may only benefit for a limited time (Kaiser in van Kleeck et al., 2010). In contrast, few recommendations have focused on children’s language comprehension, though some have pointed to the need to understand more about this issue (Fey, 2008; Fey et al., 2003; van Kleeck et al., 2010). Increased consideration of children’s language comprehension is desirable, in our view, given that children can understand grammatical features of spoken language long before they produce those features in their own spoken language.

The Current Study

It has been suggested that the use of telegraphic input is common among SLPs (Eisenberg, 2014; Kamhi, 2014; Paul et al., 2018). To our knowledge, however, this question has not been empirically investigated. The goal of the current study was to characterize SLPs’ practices and perspectives on telegraphic input when working with children with language delays. The study addressed three research questions: (a) To what extent and in what therapeutic contexts do SLPs report using telegraphic input when speaking to a child with a language delay? (b) To what extent and in what therapeutic contexts do practicing SLPs feel that it is useful to produce telegraphic input when speaking to a child with a language delay? (c) What child characteristics do SLPs view as most important when deciding what type of language input to provide?

Given the descriptive nature of this study and the lack of previous information on clinical practices in this area, our hypotheses were general. We expected that many (but not all) SLPs would report using telegraphic input across therapeutic contexts. Similarly, we expected that many SLPs would view telegraphic input as useful for a variety of reasons, including supporting verbal imitation and helping children understand spoken language. Finally, given that previous recommendations for telegraphic input have been based primarily on children’s spoken (i.e., expressive) language abilities (Fey, 2008; van Kleeck et al., 2010), we predicted that SLPs would rate expressive language level as the

most important child characteristic to consider for clinical decision making.

Method

Participants

Survey respondents were recruited from a university-sponsored professional development conference focused on current best practices in speech-language pathology. The conference took place in August 2017, in the Nashville area. Conference attendees were notified about the opportunity to participate in the survey through electronic conference materials and on-site verbally. Of the 262 SLPs who attended the conference, 93 completed the survey. Seventy-nine of the 93 respondents completed the survey on site at the conference on their personal electronic devices, and 14 completed it after the conference, following a second e-mail invitation to participate. Only practicing clinical SLPs were included in the current study. Respondents who were students, university faculty, or were currently unemployed were excluded. Because no personal identifying information was collected from the respondents, the study was designated as exempt by the university institutional review board.

All 93 respondents were female. Two respondents did not report their age, and one additional data point indicating an age of 9 years was removed because it was presumed to be inaccurate. For the remaining 90 respondents, the mean age was 38.42 years ($SD = 10.12$, range: 24–66). Three people did not report their years of experience as an SLP. For the remaining 90 respondents, the mean number of years of experience was 11.81 ($SD = 8.86$, range: 0–37). Nine people did not report their years of experience as a school-based SLP. For the remaining 84 respondents, the mean number of years of experience in a school was 9.41 ($SD = 8.80$, range: 0–37). Full demographic information is presented in Table 1.

Survey

The authors developed the survey. Feedback from fellow SLPs on earlier drafts of the survey was incorporated into the final version. The respondents completed the survey in a median of 23 min. The survey was administered in REDCap (Harris et al., 2009), an electronic platform for survey design and administration. Prior to beginning the survey, written instructions informed potential respondents that their participation was voluntary, that they could leave questions blank if they did not want to answer them, and that they could discontinue the survey at any time. The survey was composed of several sections. The current study focused on questions about practices and perspectives pertaining to language input (see Appendix). For the section of the survey focused on language input, respondents were instructed to “focus on children with language delays who are prelinguistic (i.e., not yet producing spoken words) or at the one-word or two-word stages of spoken language development.” They were also told that “Content words refer to nouns, verbs, adjectives, and prepositions” and that

“Function words refer to determiners (e.g., a, the, some, one) and grammatical morphemes (e.g., plural –s, third person singular –s, –ing).” These definitions were included to ensure that respondents understood the terminology being used. It should also be noted that, although we use the term *telegraphic input* throughout this article, this term was not used in the survey. Instead, respondents were asked about “utterances that contain content words, but eliminate function words.” Our goal was to construct questions in a way that did not bias the respondents.

Respondents were asked about their practices on different types of language input first. Then, they were asked about their perspectives on different types of language input. Importantly, participants were not permitted to revise their previous answers on their practices after viewing the sections on their perspectives. Throughout the survey, follow-up questions were presented to probe for further information (i.e., branching logic format) for particular responses. For example, if respondents indicated that they ever (i.e., not “never”) used a particular language input strategy, they were then asked in what clinical contexts they had used that strategy. (The clinical contexts were selected based on published literature and on the authors’ experiences.) Similarly, if respondents agreed that a strategy was useful, they were then asked why they felt this particular strategy was useful. Respondents were also asked about their usage of specific utterances, including telegraphic and grammatical constructions; these data will be presented elsewhere.

Data Processing and Analysis

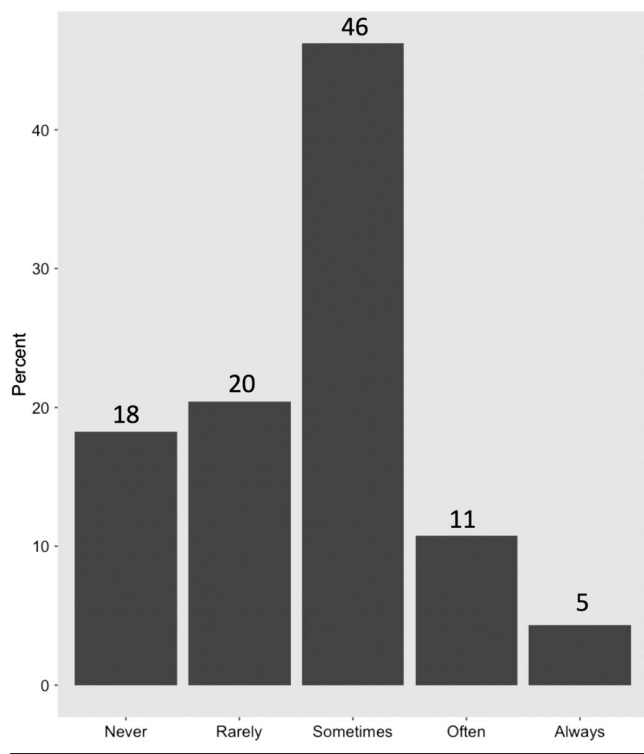
Survey data were exported from REDCap into Microsoft Excel. Data were analyzed using R Version 3.4.1 and R Studio Version 1.1.442. Nonparametric statistical tests were used because the dependent variables were categorical with a maximum of five response options. Wilcoxon signed-ranks tests, the non parametric counterpart of paired *t* tests, were used to compare SLPs’ responses to different survey questions.

Results

Our first research question was, “To what extent and in what therapeutic contexts do SLPs report using telegraphic input when speaking to a child with a language delay?” Respondents were first asked whether they produce utterances that contain content words but eliminate function words when speaking to a child with a language delay. The median response was “sometimes”; percentage data are shown in Figure 1. Eighty-two percent of respondents reported that they ever (i.e., not “never”) produce telegraphic input. Sixty-two percent reported producing telegraphic input “sometimes,” “often,” or “always.”

Respondents who reported ever producing telegraphic input ($n = 76$) were presented with three additional questions asking about the extent to which they produce telegraphic utterances in different therapeutic contexts. The median response was “sometimes” across all three contexts;

Figure 1. Responses ($n = 93$) to the question “When speaking to a child with a language delay, do you produce utterances that contain content words, but eliminate function words (e.g., ‘Dog running!’ ‘Throw ball!’ ‘Put in!’)?”



percentage data are shown in Figure 2. Although the percent of SLPs who reported “rarely” or “never” using telegraphic input was relatively consistent across contexts, the percent of SLPs who reported using telegraphic input “sometimes,” compared to “often” or “always,” differed considerably. In particular, the percent of SLPs who reported using telegraphic input “often” or “always” when prompting for verbal imitations (30%) was approximately twice the percent who reported using telegraphic input “often” or “always” when describing play or providing a directive/request (14% and 16%, respectively). Wilcoxon signed-ranks tests revealed that SLPs reported using telegraphic input more often when prompting children to verbally imitate than when describing children’s play ($p = .008$) or when providing a directive/request ($p = .006$). There was no significant difference in the extent to which SLPs reported using telegraphic input when describing play versus providing a directive/request ($p = .439$).

In summary, the analyses thus far revealed that the vast majority of SLPs reported using telegraphic input. Although it was reported to be used in all three contexts, this subgroup of 76 SLPs reported using telegraphic input more often when prompting for verbal imitations than for describing play or providing a directive/request.

Our second research question was, “To what extent and in what therapeutic contexts do practicing SLPs feel that it is useful to produce telegraphic input when speaking to a

child with a language delay?” Respondents were first asked whether it is useful for adults (e.g., parents, clinicians) to produce utterances that contain content words but eliminate function words when speaking to a child with a language delay. The median response was “disagree”; percentage data are shown in Figure 3. Over half of the sample responded “disagree” or “strongly disagree”; only 25% responded “agree” or “strongly agree.” Note that the 23 respondents who indicated agreement had also reported that they use telegraphic input in response to the previous survey question about practices.

Respondents who indicated that they “agree” or “strongly agree” that telegraphic input is useful ($n = 23$) were presented with three additional questions asking about the reasons it is useful. The median response was “agree” across all three statements; percentage data are shown in Figure 4. Wilcoxon signed-ranks tests revealed no significant differences in responses across the three statements ($ps > .112$). However, the reduced sample size may have limited our ability to detect these differences.

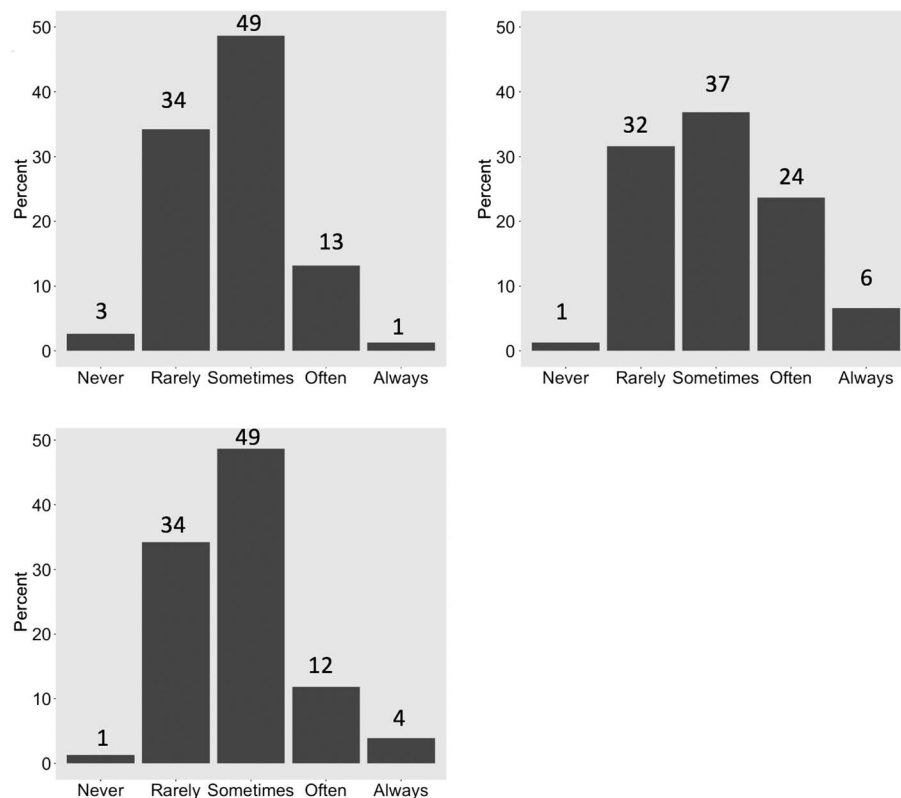
Thus far, the findings for our second aim revealed that SLPs who view telegraphic input as useful ($n = 23$) reported that they view it as similarly useful in helping children understand what is being said, produce verbal imitations, and learn semantic relationships. In cases where these respondents did not “agree” or “strongly agree,” they often reported a “neutral” response; this subgroup of SLPs rarely disagreed that telegraphic input was useful for any of these purposes.

To help interpret these results, we also examined responses regarding the usefulness of using shortened utterances. The survey item was “When speaking to a child with a language delay, it is useful for adults (e.g., parents, clinicians) to shorten their utterances.” Response options again ranged from “strongly disagree” to “strongly agree.” In contrast to the question about telegraphic input, which had a median response of “disagree,” the median response to the question about shortened utterances was “agree.” Two respondents did not answer the question about the usefulness of shortened utterances. A Wilcoxon signed-ranks test revealed that the extent to which SLPs agreed that shortening utterances is useful was significantly greater than the extent to which they agreed that telegraphic input is useful ($p < .001$). We next asked whether the proportion of SLPs who reported that telegraphic input (23/93) was useful differed from the proportion of SLPs who reported that shortened utterances were useful (59/91). Responses about usefulness were dichotomized to represent whether respondents agreed that the strategy was useful (i.e., “agree” or “strongly agree”), or whether they did not (i.e., “neutral,” “disagree,” or “strongly disagree”). Results of a McNemar test, which can be considered a within-subjects chi-square test, indicated that the proportion of SLPs who reported that shortened utterances were useful (i.e., “agree” or “strongly agree”) was significantly larger than the proportion of SLPs who reported that telegraphic input was useful ($p < .001$).

During the course of data analysis, we noticed that although many SLPs reported using telegraphic input,

Figure 2. Responses from the $n = 76$ speech-language pathologists who reported using telegraphic input, regarding how often they use telegraphic input (top left) “...when describing children’s play (i.e., commenting, linguistic mapping)”;

(top right) “...when prompting children to verbally imitate”; (lower left) “...when providing a directive/request.”



relatively few indicated that they viewed it as useful. In fact, 76/93 SLPs said they use telegraphic input, whereas 23/93 agreed (to some extent) that it is useful. This means that only 30% of SLPs who reported using telegraphic input ($n = 76$) agreed that it was useful (23/76). In contrast, 66% of SLPs who reported using shortened utterances agreed that this strategy was useful (59/90). To better understand these findings, we conducted an exploratory analysis to determine whether there was a significant difference between the proportion of telegraphic input users who viewed telegraphic input as useful (23/76) and the proportion of shortened input users who viewed shortened input as useful (59/90). Results of a two-proportions z test indicated that the proportion of telegraphic input users who viewed telegraphic input as useful was significantly smaller than the proportion of shortened input users who viewed shortened input as useful ($p < .001$).

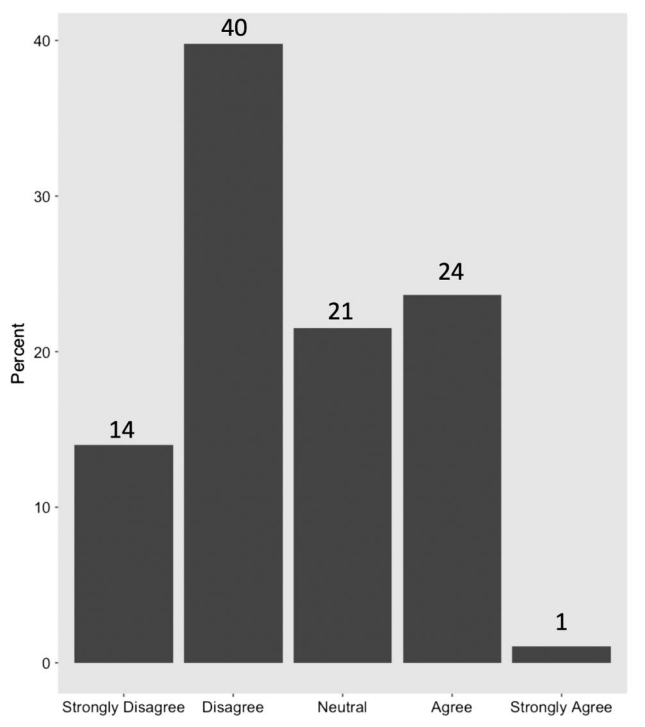
Our third research question was, “What child characteristics do SLPs view as most important when deciding what type of language input to provide?” As illustrated in Figure 5, receptive language was reported to be the most important child characteristic to consider, followed by cognitive level, expressive language, and finally by age and diagnosis. The median response for receptive language was “very important.” The median response for cognitive level,

expressive language, and age was “important,” and the median response for diagnosis was “moderately important.” Wilcoxon signed-ranks tests indicated that receptive language was reported as significantly more important than all other child characteristics, including cognitive level, expressive language, age, and diagnosis (all $ps < .001$). Cognitive level was reported to be more important than expressive language ($p = .014$), age ($p < .001$), and diagnosis ($p < .001$). Expressive language was reported to be more important than both age ($p < .001$) and diagnosis ($p < .001$), but age and diagnosis did not differ ($p = .693$).

Discussion

Consistent with our expectations, the vast majority of SLPs reported using telegraphic input with children with language delays. In fact, over half of the sample indicated that they use telegraphic input sometimes, often, or always. Only 18% reported that they never produce telegraphic input. Although SLPs reported using telegraphic input across multiple clinical contexts—commenting on children’s play, prompting for verbal imitations, and providing requests/directives—they reported using telegraphic input most often when prompting for imitations. These findings align with previous suggestions that telegraphic input usage is common

Figure 3. Responses ($n = 93$) to the survey item “When speaking to a child with a language delay, is it useful for adults (e.g., parents, clinicians) to produce utterances that contain content words, but eliminate function words (e.g., ‘Dog running!’ ‘Throw ball!’).”



among practicing SLPs (Eisenberg, 2014; Kamhi, 2014; Paul et al., 2018). To our knowledge, however, the current study provides the first empirical evidence to support these claims.

Although many SLPs reported using telegraphic input, relatively few SLPs viewed it as useful. In fact, only 30% of SLPs who reported using telegraphic input agreed that it was useful, indicating a considerable mismatch between practices and perspectives. To aid in interpreting these findings, we also examined practices and perspectives for shortened utterances more generally. Analyses revealed a significantly larger discrepancy between using telegraphic input and viewing telegraphic input as useful, than using shortened input and viewing shortened input as useful. Neither set of findings revealed 100% agreement, pointing to a need to work toward more reflective clinical practice and purposeful decision making in the context of simplifying language input. Despite the existence of discrepancies between practices and perspectives overall, the mismatch between practices and perspectives appears to be particularly pronounced for telegraphic input.

Why did so many SLPs report using telegraphic input, but so few SLPs view it as useful? Though we cannot answer this question definitively, one potential explanation for the mismatch between practices and perspectives is that SLPs' attitudes toward telegraphic input changed over the course of the survey. Through informal discussions over the past

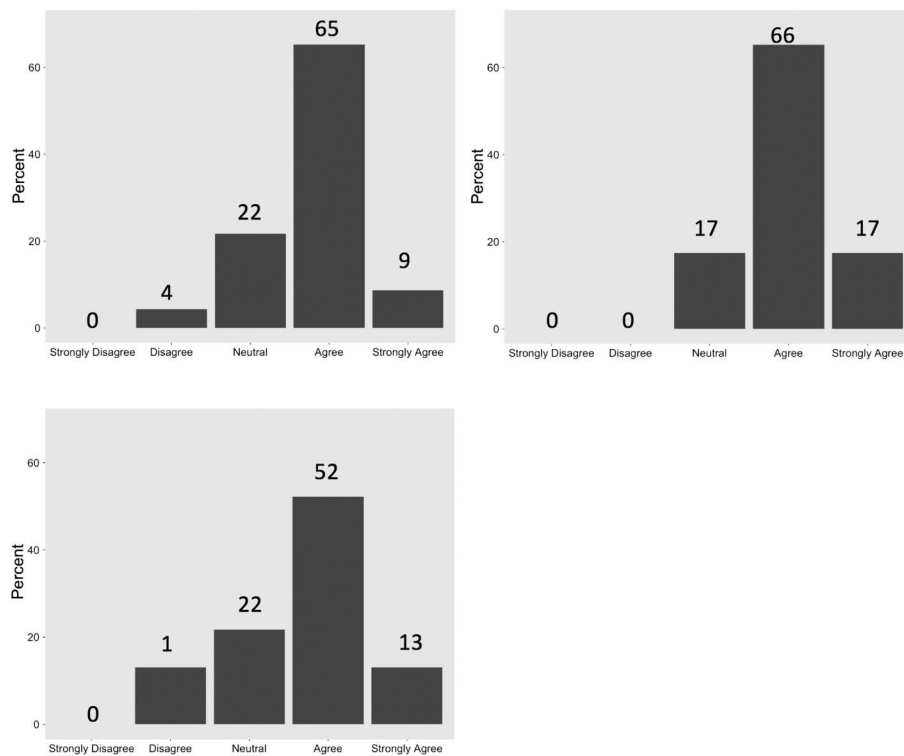
several years, it has come to our attention that many SLPs have not thought a great deal about the distinction between telegraphic and simplified, grammatical input—or about relative strengths and weaknesses of each style of input. Completing this survey may have led SLPs to reflect on the relative merits of telegraphic versus grammatical input more thoughtfully than they had in the past, leading them to question the usefulness of telegraphic models. It is also possible that responses were affected by a difference in wording across the two questions: the question about practices focused on clinicians, and the question about perspectives focused on adults (e.g., parents, clinicians).

It is unclear whether SLPs were aware that some clinical researchers and intervention approaches are currently recommending grammatical (rather than telegraphic) input. Given the limited time clinicians have available to review external research studies, and the extended timeline for research findings to reach clinical settings (Green, Ottoson, García, & Hiatt, 2009), it seems reasonable to assume that many of them had not heard about these recommendations. It is also possible that some SLPs use telegraphic input despite uncertainty about its efficacy because they do not know which type of input has more evidence to support it. Additional research is needed to determine how SLPs view decisions about simplified language input within the context of evidence-based practice.

We also examined the child characteristics that SLPs viewed as most important when deciding what type of language input to provide. Receptive language level was rated as the most important characteristic to consider, followed by cognitive level, expressive language level, and finally by age and diagnosis, which did not differ. Thus, SLPs' responses suggested that, when deciding how to simplify their language input, they focus more on what children can understand than what children can say. Although we were somewhat surprised by this result, we viewed it as a positive finding given that basing decisions on spoken language abilities alone could severely underestimate what children know. After all, children can understand a great deal more than they say, and unnecessarily limiting children's exposure to well-formed, grammatical utterances could potentially lead to further delays in their language development (Fey, 2008; Fey et al., 2003).

This finding regarding the importance of receptive language brings up another interesting point. If receptive language level was reported to be the most important consideration, followed by cognitive level and then by expressive language level, then why did SLPs report using telegraphic input most often when prompting for verbal imitations? A potential explanation is that SLPs assume that they need to provide telegraphic prompts in order to encourage children to imitate utterances containing more than just a single word. As discussed, however, research has shown that children with language delays are just as likely to imitate using either type of prompt and more likely to produce grammatical morphemes when provided with grammatical prompts (Bredin-Oja & Fey, 2014), suggesting that including these morphemes is not detrimental.

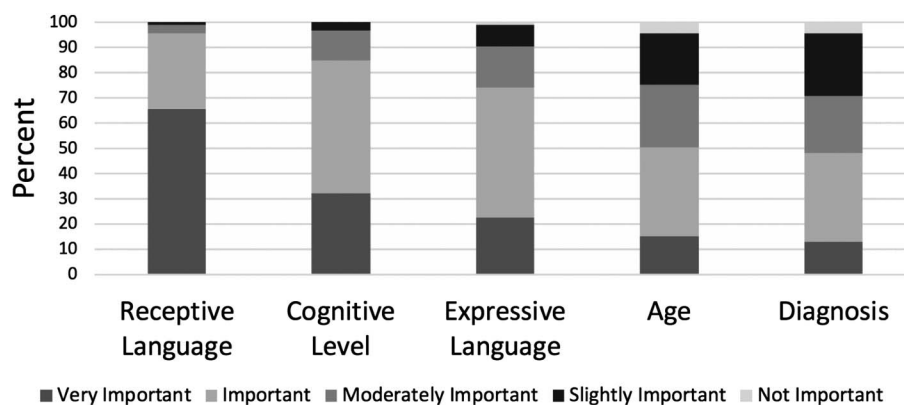
Figure 4. Responses from the $n = 23$ speech-language pathologists who agreed that telegraphic input is useful, regarding how useful they view telegraphic input for (top left) helping children understand what is being said, (top right) helping children produce verbal imitations, and (lower left) helping children learn semantic relationships (e.g., agent-action).



When making decisions about simplified language input, SLPs must consider not only how they impact a child within one-on-one interactions, but also how they may influence other individuals within the child's environment. If

other adults use telegraphic input because they are following the SLP's lead, a child's exposure to well-formed, grammatical utterances may be limited not only within interactions with the SLP, but also in their interactions with other people.

Figure 5. Responses ($n = 93$) from speech-language pathologists regarding the importance of certain child characteristics when deciding what type of language input to use when speaking to a child with a language delay. The survey item was "When deciding what type of language input to use when speaking to a child with a language delay, how important is each of the following?" The characteristics included were Child's spoken (i.e., expressive) language level, Child's receptive language level, Child's chronological age, Child's overall cognitive level, and Child's diagnosis (e.g., autism spectrum disorder, Down syndrome, general language delay).



Although this question has not been empirically investigated, it is also possible that observing an SLP use telegraphic input with a child may lead people to underestimate that child's abilities. The use of telegraphic input also has the potential to affect a child's own view of himself or herself, particularly as the child grows older. One of the survey respondents alluded to this possibility in a free-form comment, saying, "Chronological age becomes more important as the child becomes older. Just because they [cannot] speak doesn't mean they [cannot] understand and you don't want to insult them."

In future discussions of telegraphic versus grammatical input, we suggest that it will be critically important to consider the distinction between length and grammaticality. Utterances can be simplified, but still maintain the grammatical rules of English. For example, though they are incomplete, phrases such as *My ball*, *More milk*, *Go, car!*, *Running fast*, *Open it!* and *Under the table* all maintain grammaticality within shortened utterances. In addition, single words, though brief, do not violate the grammatical rules of English. After all, single words are often produced in everyday conversation in ways that are entirely acceptable (e.g., *Do you want orange or blue? Blue.*). Thus, it is clear that length and grammaticality are separable constructs. To ensure that these constructs are not conflated, we must be intentional about the terminology we use to describe different types of simplified language input. Instead of more general terms such as *reduced* versus *nonreduced*, or *simplified* versus *expanded*, we recommend the use of the term *telegraphic input* to describe shortened utterances that violate grammatical rules, and the term *simplified, grammatical input* to describe shortened utterances that maintain these rules.

The current study had several limitations. The sample was small and did not represent a great deal of racial, ethnic, and geographic diversity, potentially limiting the extent to which the findings generalize to the broader population of SLPs. Participants were recruited from the Nashville area and may have been influenced by the theoretical views of clinical researchers in the same geographic region. It is important to learn more about SLPs who work with young children, but only 18% of respondents were treating children between birth and age 3 years. Because this study used survey methodology, SLPs' responses may not have accurately reflected the strategies they use in clinical practice. For this reason, observational studies are an important next step. Furthermore, respondents may have altered their responses, either intentionally or unintentionally, based on what they thought we (the researchers) wanted to hear. Although we wrote the survey questions in as objective a manner as possible, providing clear definitions and examples and avoiding the use of potentially loaded terminology (e.g., telegraphic, grammatical), it is possible that our own biases in support of grammatical input were somehow apparent. The survey did not probe why some respondents never or rarely produced telegraphic input, thereby limiting what we know about clinical decision making as it pertains to simplified input. These limitations can be addressed by in-depth, qualitative studies that characterize the complex interactions among

beliefs, experiences, practices, and perspectives pertaining to simplified language input.

In our view, these findings point to the need for more purposeful clinical decision making when providing simplified language input—fully understanding not only what we do but also why we are doing it. Paul et al. (2018) also highlighted this point, stating that, "Because [linguistic input] is such an important tool, we need to think very carefully about the input we present to the child, in terms of both its meaning and its formal properties" (p. 84). Indeed, reflective clinical practice will help to ensure that one of our most essential tools—language input—is used purposefully and in a manner that will best benefit the children we serve. Reflective clinical practice will also help us to be maximally effective in collaborating with caregivers and other professionals. After all, they are likely looking to SLPs as the experts in determining the most effective ways to simplify language input when talking to young children with language delays, with the common goal of maximizing children's long-term language outcomes.

Acknowledgments

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Confidential

SLP Clinical Practices Survey

Record ID _____

The purpose of this study is to investigate the practices and perspectives of speech-language pathologists related to selected topics. You will be asked to complete a series of questions about your current practices and perspectives on selected topics. You will also be asked to complete questions about your clinical experience (e.g., years of experience and ages served). The survey is expected to take approximately 15 minutes. You may save your responses and return at a later time. If you choose to save your responses, the system will show you a password. You will need that password when you are ready to continue the survey later.

Participation in the study is completely voluntary. If you are uncomfortable answering any questions, you may leave them blank. You may discontinue the survey at any time.

If you have any questions or concerns about the study, you may contact Jena McDaniel, MS, (study coordinator) or C. Melanie Schuele, PhD, (principal investigator) at languelab@vanderbilt.edu or 615-936-5136.

Part 1: Clinical Experience

Which of the following best describes you?

- Student in master's program
- Student in doctoral program
- Speech-language pathologist - currently employed
- Speech-language pathologist - currently unemployed
- Retired speech-language pathologist
- Other

How many years of your program have you completed?
For example, enter "1" if you will be entering your second year this fall?

If "Other," please explain

Are you a clinical fellow (i.e., currently completing your clinical fellowship)?
If you are beginning your clinical fellowship this August, mark "Yes."

- Yes
- No

Enter your current age in years.

Across your career, how many full time equivalent years have you practiced as a speech-language pathologist?
Include through the 2016-2017 school year, but do not include the 2017-2018 school year.

IF YOU WORKED FULL TIME IN A SCHOOL: Count each school year as one year whether or not you worked in the summer.

IF YOU WORKED A FULL TIME 12-MONTH POSITION NOT IN A SCHOOL: Count each 12-month period as one year.

IF YOU WORKED PART-TIME: Adjust part-time positions to full time equivalents. For example, two years of working half time would equal one full time equivalent year. Round to the nearest whole number.

IF YOU ARE COMPLETING YOUR CLINICAL FELLOWSHIP IN 2016-2017: Enter "0".

IF YOU ARE A STUDENT: If you have not had paid clinical experience working as a speech-language pathologist, enter "0".

Of the total full time equivalent years you have worked, how many of those full time year equivalent years were spend in a school-based practice of speech-language pathology?
Include through the 2016-2017 school year, but do not include the 2017-2018 school year.

IF YOU WORKED FULL TIME IN A SCHOOL: Count each school year as one year whether or not you worked in the summer.

IF YOU WORKED PART-TIME: Adjust part-time positions to full time equivalents. For example, two years of working half time would equal one full time equivalent year. Round to the nearest whole number.

IF YOU ARE COMPLETING YOUR CLINICAL FELLOWSHIP IN 2016-2017: Enter "0".

IF YOU ARE A STUDENT: If you have not had paid clinical experience working as a speech-language pathologist, enter "0".

In which state do you work? Format: Enter the two-letter abbreviation, such as "TN" for Tennessee.

If you work in more than one state, enter the one in which you spent the most working hours for the 2016-2017 school year.

If you are a graduate student, enter the state in which you attend graduate school.

Are you employed by a school district?

- Yes
- No

Which school district are you employed by?

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In May 2017, approximately how many children were on your caseload in total?

In May 2017, approximately how many children on your caseload were birth to 3 years old? Note: Only include children up to age 3. Do not include children who have already turned 3 years old. (Enter a number, such as "20".)

In May 2017, approximately how many children on your caseload were 3 to 5 years? (Enter a number, such as "20".)

In May 2017, approximately how many children on your caseload were in elementary school? (Enter a number, such as "20".)

In May 2017, approximately how many children on your caseload were in middle school? (Enter a number, such as "20".)

In May 2017, approximately how many children on your caseload were in high school? (Enter a number, such as "20".)

In May 2017, approximately how many children on your caseload were in high school? (Enter a number, such as "20".)

Select your highest degree.

- High school degree or equivalent
- Bachelor's degree
- Master's degree
- Doctorate degree

Do you have a master's degree in speech-language pathology?

- Yes
- No

Enter the year you earned your master's degree in speech-language pathology.

Do you have a CURRENT Certificate of Clinical Competence from the American Speech-Language-Hearing Association?

- Yes
- No

Have you ever held a Certificate of Clinical Competence from the American Speech-Language-Hearing Association?

- Yes
- No

Do you have a CURRENT license from your state to practice speech-language pathology?

- Yes
- No

Do you have a CURRENT teaching license or certificate from your state to work as a school speech-language pathologist?

- Yes
- No

If you have additional comments you would like to share regarding your clinical experience, please type them here.

Select your sex.

- Male
- Female
- Other
- I prefer not to answer

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Which race category(ies) best describe(s) you? These categories are taken directly from the US Census Bureau listing. You may choose more than one.

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- I prefer not to answer

Which ethnicity best describes you?

- Hispanic or Latino
 - Not Hispanic or Latino
 - I prefer not to answer
-

Part 3: Language Input

This part of the survey is about the language we use when speaking to children with language delays.

Here, we focus on children with language delays who are prelinguistic (i.e., not yet producing spoken words) or at the one-word or two-word stages of spoken language development.

Content words refer to nouns, verbs, adjectives, and prepositions.

Function words refer to determiners (e.g., a, the, some, one) and grammatical morphemes (e.g., plural -s, third person singular -s, -ing).

When speaking to a child with a language delay, do you shorten your utterances, compared to utterances you would typically produce during adult conversational speech?

- Never
- Rarely
- Sometimes
- Often
- Always

	Never	Rarely	Sometimes	Often	Always
Do you shorten your utterances when describing children's play (i.e., commenting, linguistic mapping)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you shorten your utterances when prompting children to verbally imitate?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you shorten your utterances when providing a directive/request?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When speaking to a child with a language delay, do you produce utterances that contain content words, but eliminate function words (e.g., "Dog running!" "Throw ball!" "Put in!")?

- Never
- Rarely
- Sometimes
- Often
- Always

	Never	Rarely	Sometimes	Often	Always
Do you produce utterances that contain content words, but eliminate function words, when describing children's play (i.e., commenting, linguistic mapping)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you produce utterances that contain content words, but eliminate function words, when prompting children to verbally imitate?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you produce utterances that contain content words, but eliminate function words, when providing a directive/request?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When speaking to a child with a language delay, do you emphasize certain content words by making them louder and longer than function words (e.g., "The DOG is RUN-ing!" "THROW the BALL!" "PUT it IN!")?					
			<input type="radio"/> Never		
			<input type="radio"/> Rarely		
			<input type="radio"/> Sometimes		
			<input type="radio"/> Often		
			<input type="radio"/> Always		
Do you emphasize content words when describing children's play (i.e., commenting, linguistic mapping)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you emphasize content words when prompting children to verbally imitate?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you emphasize content words when providing a directive/request?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix (p. 7 of 9)

Survey

A child with a language delay may understand language that is more complex than what he or she can say.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

A child with a language delay may understand the language that he or she hears, even if he or she does not clearly show that he or she understands.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

When speaking to a child with a language delay, it is useful for adults (e.g., parents, clinicians) to shorten their utterances.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Producing shortened utterances is useful because it helps children understand what is being said.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Producing shortened utterances is useful because it helps children produce verbal imitations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Producing shortened utterances is useful because it helps children learn semantic relationships (e.g., agent-action).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When speaking to a child with a language delay, it is useful for adults (e.g., parents, clinicians) to produce utterances that contain content words but eliminate function words (e.g., "Dog running!" "Throw ball!").

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

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	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Producing utterances that contain content words but eliminate function words is useful because it helps children understand what is being said.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Producing utterances that contain content words but eliminate function words is useful because it helps children produce verbal imitations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Producing utterances that contain content words but eliminate function words is useful because it helps children learn semantic relationships (e.g., agent-action).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When speaking to a child with a language delay, it is useful for adults (e.g., parents, clinicians) to emphasize certain content words by making them louder and longer than function words (e.g., "The DOG is RUN-ing!" "THROW the BALL!").					
Emphasizing content words is useful because it helps children understand what is being said.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emphasizing content words is useful because it helps children produce verbal imitations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emphasizing content words is useful because it helps children learn semantic relationships (e.g., agent-action).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

When deciding what type of language input to use when speaking to a child with a language delay, how important is each of the following?

	Not important	Slightly important	Moderately important	Important	Very important
Child's spoken (i.e., expressive) language level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Child's receptive language level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Child's chronological age	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Child's overall cognitive level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Child's diagnosis (e.g., autism spectrum disorder, Down syndrome, general language delay)

If you have additional comments you would like to share regarding language input, please type them here.
