The Pragmatics of Paediatric Language Intervention

Issues and Analysis

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1.   Introduction and Background

The purpose of this chapter is to examine the pragmatic aspects of a number of widely used paediatric language intervention programs. Although the focus of intervention is often on the structural aspects of language (Camarata, Nelson, and Camarata 1994; Fey 1986; Fey, Windsor and Warren 1995; Lahey 1988), the actual intervention is completed within a social context with its own set of pragmatic parameters. These parameters vary considerably across treatment types and may also diverge substantially from the contexts associated with natural language learning (Moerk 1992) or with other learning contexts (e.g. preschool). The pragmatic characteristics of six intervention procedures used commonly and drawn from a diverse range of theoretical orientations will be reviewed below.

In addition, the treatments reviewed above do not include direct teaching of metalinguistic or metapragmatic skills. In young children, through early school age (i.e., into first or second grade; approximately 8;0), the focus of intervention is often on establishing use of linguistic structures. After the child enters school, the focus of intervention often shifts to metalinguistic, and for those children with pragmatic disabilities, to metapragmatic teaching approaches (Lahey 1988). The review of procedures in this chapter will be limited to procedures focusing on the preschool to early school age populations (and thus exclude metalinguistic/metapragmatic protocols).

In order to complete this review, one must first adopt a framework for examining the pragmatic characteristics of an intervention. Given the variability in pragmatic analysis schemes available currently (Ball, this volume; Conti-

Ramsden 1990; Prutting and Kirchner 1987), and the fundamentally different assumptions surrounding the role of pragmatics in language acquisition (e.g. Bates 1976), the framework selected for this chapter will be described in this section. At issue is the selection of the best means for characterizing the social context associated with the clinical procedures under study. Webster's Third International Dictionary (1969) includes the following definition of pragmatics: "a branch of semiotics that deals with the relation between signs or linguistic expressions and their users." Although this definition captures the essence of pragmatics, it is insufficient to generate a concise set of analyses to evaluate the social use of language in the clinical contexts (as can be seen in Ball, this volume). Indeed, it could be argued that the parameters measured in experimental contexts may not capture key aspects of the social behaviors observed clinically (see Prutting and Kirchner 1987). This may be due in part to the divergent goals of research and clinical practice: the former is often concerned with detailed descriptions of relatively narrowly defined parameters, whereas the latter is often concerned with more global judgements of adequacy in everyday communicative environments.

Thus, from a broad perspective, one must first decide to adopt an integrated, formalist or functionalist, figure-ground position on pragmatics (Owens 1991; Prutting 1979). The formalist, integrated perspective places the pragmatic domain as one of the integrated parts of language. For example, Camarata (1991) describes language as a interaction among phonologic, semantic, syntactic, morphologic, and pragmatic domains. Crystal (1987) proposes several 'levels' of language domains that include those described in Camarata, but with additional components such as phonemic and phonetic levels in addition to a prosodic component (which are subsumed under phonology). Similarly, Bloom and Lahey (1978) present an integrated coordination of content, form, and use (use in this case relates to the pragmatic domain) as the basis for language. In short, the formalist perspective focuses on the social use of language as window into the child's acquisition (and competence) of language structure.

In contrast, the functionalist perspective places social interaction (and pragmatic context) at the root of language, as the basis for communication (Bates and McWhinney 1989, also chapters, this volume). These assumptions of course have direct implications on how pragmatic analysis is conducted. The formalist approaches result in lists of communicative behavior observed during conversation (Dore 1974; Miller 1981; Prutting and Kirchner 1987, Prutting 1979; Leonard, Camarata, Schwartz, Rowan and Chapman 1982) whereas functionalist approaches result in detailed descriptions of the context surrounding and

supporting communication (Bloom 1993; Prutting 1979). Thus, to complete a pragmatic analysis of the treatment context, one could classify the ways that children and clinicians use the various pragmatic structures reported in the literature (e.g. the Pragmatic Protocol, Prutting and Kirchner 1987) and/or one could examine the social contexts that serve as the backdrop for intervention.

Given my previous adoption of a formalist perspective in modeling language (Camarata 1991) and in intervention studies (Camarata 1993; Camarata and Nelson 1992; Camarata *et al*. 1994), it is ironic that the pragmatic review in this chapter will, although it will include formal elements, be completed primarily from a functionalist perspective. This choice is predicated upon the basic characteristics of intervention activities which, even in the most 'naturalistic' types, arise from the social context of delivering clinical services to the child. In a sense, the clinical motivation serves as the background for clinical activities, in much the same manner as functionalists argue that communication arises from the social context (Searle 1969). Thus, the pragmatics of language interventions can perhaps be best viewed as arising from a set of principles underlying the basic assumptions of the intervention. In this sense, the pragmatic context is, unlike many conversational contexts, under the direct or indirect control of the clinician. Stated simply, the social context of the intervention is the direct by-product of the type of intervention selected; a situation that is perhaps best examined within a functionalist perspective. Therefore, for the purposes of this chapter, pragmatics will be defined as the description of the social aspects of the language interaction between the clinician and the child during intervention activities. What follows is a commentary on the dynamics of this interaction and a comparison to the kinds of social interaction the child is likely to encounter in conversations outside of the clinic. As noted above, the evaluation of the individual treatments will be completed using a functionalist approach. This will thus involve a description of the treatment procedures and a detailed description and analysis of the social context for each treatment.

2.   Treatment Orientations

There have been a rather large number of treatments for paediatric language disorders from an equally large number of theoretical orientations proposed in the past few decades (cf. Fey 1986). These range from unconscious conflicts within a Freudian perspective (Wyatt 1969); environmental deprivation (Curtiss 1977); faulty learning from a Skinnerian perspective (McReynolds 1987); defects

in the child's information processing skills (Kirk and Kirk 1971) and/or neurological system (Myklebust 1971; Benton 1964; Plante, Swisher, Vance and Rapcak 1991; Aram 1988); to genetic defects (Pinker 1995; Tomblin 1989). Not surprisingly, these different positions on causality often translate into strikingly different intervention procedures. For example, therapy completed using traditional operant learning procedures (Skinner 1957) bears little resemblance to treatment arising from more cognitivist perspectives (Muma 1978). However, despite these differences, it is possible to classify interventions into more general categories. For example, Fey (1986) used clinician oriented, child oriented, and hybrid designations. Camarata (1995; 1996), wishing to avoid operant and cognitivist classifications in his review of phonological treatments used a functional "analog/didactic" and "naturalistic" dichotomy.

Because the focus of this chapter is on the social context surrounding treatment, while examining a wide range of approaches, this dichotomy is expanded to include six representative interventions. These range from the most direct type of analog/didactic treatment founded upon traditional operant procedures to 'whole language' procedures which are the functional antithesis to analog procedures (Norris 1990; Norris and Hoffman 1993). Ordinal subdivision of these poles includes incidental teaching, milieu teaching, natural language paradigm, conversational recast procedures, and whole language. Each was selected to represent a shift from the high degree of clinician control associated with didactic methods towards the high levels of child control in whole language methods. It is important to note that this range is predicated upon characteristics of the treatments rather than adoption of a particular causal basis for the language disorder. It is clear that different assumptions about causality can result in similar treatment contexts. For example, the operant perspectives of McReynolds and the government-binding theories of Chomsky (1982) as implemented by Connell and Stone (1992), arise from very different theoretical frameworks, and include orthogonal perspectives on target selection, nonetheless are highly similar regarding the actual treatment context. Similarly, identical assumptions regarding causality can result in remarkably different treatment contexts. For example, Camarata *et al*. (1994), and Kirk and Kirk (1971) adopt an information processing perspective on language disorders, yet the former have adopted a conversation based intervention procedure whereas the latter include traditional didactic procedures. Thus, the procedures reviewed below are based upon the treatment context rather than on the position the authors have adopted regarding causality.

3. Analog/Didactic Imitation Based Intervention

3.1 *Description of the Intervention*

As noted above, analog/didactic treatment is rooted in traditional operant methodology (Skinner 1957). This has been a widely used procedure (Camarata *et al.* 1994; Fey 1986) and could be said to be the foundation for an entire class of intervention methods with operant underpinnings. Perhaps the most straightforward presentation of this procedure is the Monterey Language Program (Gray and Ryan 1973). The focus of analog treatment is the elicitation and reinforcement of targeted language structures. In order to do this, the clinician selects relevant goals (see Connell 1987 for a discussion of goal selection for this approach), and elicits production in a series of programmed steps designed to provide maximum saliency and behavioral support for initial production followed by a systematic fading of these supports and increasing delays and flexibility in reinforcement schedules (and reinforcers) as the child successfully produces the selected target(s). For example, assume the target is the auxiliary form "is" (e.g. "the boy is running"). In the analog/didactic approach, the clinician presents a picture representation of the target and a model "the boy is running" followed by a request for direct imitation "say the boy is running." If the child correctly imitates the model, verbal and/or tangible reinforcers are delivered. If the child's production is incorrect, feedback is provided in the form of verbal instructions and withholding the reward. When the child reaches a preset level of correct responses (of a percentage of overall attempts), the imitative prompt is faded. After the criteria for this level has been achieved, the model is also faded and so on until the child reaches generalized production that is minimally supported by clinician cues, prompts, and reinforcers. Although this paradigm was developed and adopted several decades ago, elements of this approach continue to be used widely in clinical settings with a variety of treatment targets (e.g., focused imitation was a part of the clinician training condition within Fey, Cleave and Long 1997, and imitation continues to be used extensively with phonological goals; see Camarata 1995, 1996). Note that this approach has been used widely with a wide variety of disability typologies, including specific language impairment, children with developmental delays, children with autism, and children with hearing impairments (see the review in Fey 1986).

3.2 *Example of Clinical Interaction*

This approach is often completed while the child and the clinician are seated at

a table. Materials typically include photos depicting target sentences. Real objects (e.g., toys) are also included if appropriate. To initiate a teaching episode, the clinician shows the child a picture or object. In this example, assume the target is the auxiliary form of "be".

(1)   Clinician Look, the boy is running. Say: The boy is running.
         Child   (incorrect response) boy running
         Clinician (no reinforcer is delivered) No, say: The boy IS running.
                    (with added emphasis on the target.)
         Child   (correct response) The boy is running.
         Clinician (delivers token reinforcement) Yes, good!

In subsequent sessions, the clinician model and prompt are faded.

(2)   Clinician (shows picture) Look at this!
         Child   The boy is running.
         Clinician (delivers token) Yes, good!

Then, the clinician fades the reinforcers so that the child says the target form in response to being shown the picture (or object). Token reinforcers include coins, plastic chips, or markers that can be exchanged for small toys or stickers at the end of the treatment session.

3.3 *Pragmatic Aspects of the Intervention*

Consider the child-clinician interaction from a functionalist pragmatic perspective: the context for the interaction often includes a small room in a clinic. The clinician exercises relatively tight control over stimuli in order to provide maximum salience and support for elicited production of the targets. In addition, materials are selected and presented by the clinician. From a conversational perspective, the goal of the interaction is direct imitation of the clinician model and few features of typical conversations are present in the clinician-child interaction. Thus, the pragmatic aspects of didactic/analog intervention include almost exclusively directives from the clinician and responses from the child, particularly during the initial phases of intervention.

     As the child progresses through treatment, the clinician directives shift from verbal to nonverbal, but the primary context and conversational expectations remain; the child is expected to produce targets in response to clinician provided cues. Another pragmatic aspect of analog/didactic intervention relates to the delivery of verbal reinforcers. The pragmatic character of these shifts the context, from responding to directives to a metalinguistic focus on the accuracy of the

child's imitated response. To summarize, the analog/didactic intervention includes few conversational elements and the purpose of the interaction is to elicit imitated production from the child.

In our own clinic, the analog/didactic approach has sometimes been associated with interesting errors in the child's production during spontaneous attempts. That is, the focus on production of forms in the context of clinician directives exclusively may result in attention to the targeted structures without knowledge of function. The exchanges below, observed in our clinic, illustrate this result. In the following sequence, the language target was full propositional complement (e.g., I know who lives in that house). In this game, the clinician models the target and the child provides an answer. Then the child is required to produce the target with new words (this is a generalization phase).

(3)   Clinician I know what lives in the tree.
          Child   Monkeys!
          Child   I know who lives in the cat.
          Clinician What?
          Child   No, I know who lives in the police woman.
          Clinician What?
          Child   I said that word!

This example suggests that the child was attending to the form without regard to the meaning of the target phrase. At this point in acquisition, the child is producing the target correctly from a grammatical standpoint while making mistakes in meaning. We have observed this type of error only within analog/didactic treatments.

3.4 *Relationship to Pragmatics of Generalization*

This section is devoted to the comparison of the pragmatic aspects of the intervention to a more generalized context; spontaneous language in a variety of natural (versus clinical) contexts. Indeed, perhaps the strongest test of the effectiveness of the intervention is whether the targets are used in spontaneous language samples in generalization settings such as the home and/or school while talking to peers, siblings, and parents and other adult relatives. A further test of generalization is whether the child uses the targets in a variety of pragmatic roles; across settings, across conversation partners, and appropriately across formal pragmatic categories (e.g. in topics, responses, answers, requests, etc.).

From this perspective, there appears to be little overlap between the training context and the generalization context. Brown and Hanlon (1970) observed few

overt, didactic/analog teaching episodes in a review of mother–child samples. Indeed, the relative infrequency of such episodes in normal language acquisition has prompted a shift in the operant accounts of language acquisition (see Bohannon and Warren-Leubecker 1989; Moerk 1992). However, it should be noted that the focus of didactic/analog intervention is squarely on elicited production because of the belief that the child will generalize to the ambient context if a target is added to the production repertoire. Before this assumption is dismissed (and this entire section is simply viewed as a "straw man"), it is important to note that although there have been numerous reports of difficulty in achieving generalized use of targets learned under didactic/analog approaches (see Fey 1986; Koegel, O'Dell, and Koegel 1987); several reports (including our own work: Camarata *et al*. 1994; Nelson, Camarata, Welsh, Butkowski, and Camarata 1996) have revealed that children with specific language impairments sometimes learn and use targets in spontaneous language samples under didactic/analog training conditions. Indeed, Connell and Stone (1992) argue that direct imitation is the most efficient procedure for treating children with specific language impairment. Thus, in some cases, it appears that establishing productivity via imitation is sufficient for generalization to occur despite the pragmatic mismatch between the learning conditions and the generalization contexts. However, regardless of one's theoretical orientation, all agree it is clear that didactic/analog approaches intersect the generalized conversation context at very few points. The entire treatment context is designed to be dissimilar in order to highlight targets that the child is having difficulty learning in home and school contexts.

4.   Incidental Teaching

4.1 *Description of the Intervention*

This approach was developed in order to teach language skills in contexts that more closely parallel the child's typical language use setting. First developed by Hart and Risley (1968), it has been recently updated and continues to be used in the United States, particularly in Special Education (Hart and Risley 1995). Because the program has been evolving over the past 30 years, it is difficult to incorporate all elements in a summary description of this type. However, it is perhaps reasonable to describe the approach as including the embedding of prompts, cues, and reinforcers into contexts wherein toys and other desired objects are controlled by the clinician in order to promote language production

in the child. In the early versions of incidental teaching, the toys were placed outside the child's reach and were delivered only if the child imitated the targeted language form correctly (Hart, Reynolds, Baer, Brawley and Harris 1968; Hart and Risley 1968). It is also important to note that two of the approaches described below, milieu teaching and natural language paradigm are related to this approach and, in the case of milieu teaching, arose directly from the incidental teaching paradigm (Warren and Kaiser 1986; Warren, McQuarters and Rogers-Warren 1984). For the purposes of this discussion, the key elements of this approach include clinician prompting, requests for imitation and the delivery of social and, in some versions, tangible reinforcers within a context that includes toys and, in some versions, play activities. This approach, and milieu teaching, have been completed primarily with children with developmental disabilities (see Kaiser 1993).

4.2 *Example of Clinical Interaction*

In this intervention, desired objects are arranged so that the child cannot reach them. For example (adapted from Hart and Risley 1968; Hart and Rogers-Warren 1978), assume the targets for the following example include color names and requests. The clinician provides paint brushes and paper on the table in front of the child, but ensures that the paints are out of reach on a shelf above the table (but in view of the child).

> (4)   Clinician Let's paint a picture.
>   Child   (gestures to paints)
>   Clinician What do you want? Say: I want the blue paint.
>   Child   Paint, want paint.
>   Clinician Say: I want the blue paint.

If the child says the full target, or an appropriate approximation ("I want the blue paint," or "blue paint"), the clinician delivers the requested object (in this case a can of blue paint) and may also include a social reinforcer ("good talking"). If the child does not respond correctly, the clinician may shorten the target phrase ("say: blue paint"), or direct the child's attention to another object. This sequence continues until the child is successful in producing the target or an acceptable approximation.

4.3 *Pragmatic Aspects of the Intervention*

Because the primary focus within incidental teaching remains on inducing

production of key language targets, the social context in many ways closely parallels analog/didactic approaches. The clinician retains relatively exclusive control of the conversational dynamics: inducing the child to produce the language targets and delivering corrective feedback and/or reinforcers following child responses. As with the analog/didactic approach, the focus of the intervention is not on typical conversation, and interaction between the clinician and child is primarily model-direct request on the part of the clinician, followed by imitative response by the child and metalinguistic feedback by the clinician. However, unlike analog/didactic training, incidental teaching is conducted in play contexts, or minimally in contexts wherein toys and other play objects are included in training.

4.4 *Relationship to Pragmatics of Generalization*

The above analysis of incidental teaching suggests that it shares many of the pragmatic characteristics of analog/didactic treatment, including overt models and direct requests for imitation and overt social and/or tangible reinforcement. As noted above for analog/didactic training, relatively few of these types of episodes are present in the child's everyday language exchanges. However, unlike analog/didactic training, incidental teaching does include toys and play contexts and overlaps the pragmatic characteristics of the generalization setting in a number of ways, particularly in the request of objects. In analog/didactic approaches, object names are often trained as a learned response to picture and/or object stimuli presented to the child in terms of confrontation naming. For example, the clinician might show the child a picture of a ball or present a ball to the child and pair this with a model and a request for imitation: "Look, ball. Say: ball". In contrast, incidental teaching approaches often include placing the ball out of the child's reach and presenting the model and the request for imitation when the child shows interest in playing with the ball (cf. Hart and Risley 1968). The stated rationale for this includes increased motivation for production of the object name in a requesting social context (termed "mands" in the operant literature; Mowrer 1984).

Consider the functional pragmatics of this type of teaching episode: the child demonstrates, either verbally or nonverbally, that an out of reach object is desired, and the clinician provides a model and request for imitation in response to this request. This closely parallels important pragmatic aspects of the generalization context; mothers often respond to a child's request for an object with an object label (although a following request for imitation is less common, see Conti-Ramsden 1990; Moerk 1992). Perhaps not surprisingly, incidental teaching

is very successful when attempting to train use of mands (Hart and Risley 1995). It should be noted that less overlap between incidental teaching and generalization contexts is evident in other pragmatic aspects. Interestingly, the incidental teaching approach has often been less successful when teaching language forms other than mands (see the review of incidental teaching in Fey 1986 and in Camarata, 1991).

5.   Milieu Teaching

5.1   *Description of the Intervention*

Milieu teaching was directly developed from incidental teaching, primarily by students of Hart and Risley (particularly Kaiser and Warren). This approach includes the basic elements of incidental teaching (i.e. models and requests for imitation), but also includes increased flexibility in modeling (and prompting imitation) of other types of child productions. Recent versions (Kaiser and Hester 1994) of milieu teaching include interacting with the child in play contexts while the clinician selects a set of developmentally appropriate language goals to model (and elicit) during play. In addition to the mand contexts used in incidental teaching (and described above), milieu teaching includes models and imitation requests that involve additions to a child's immediately preceding productions. That is, milieu teaching episodes include a broader range of activities and training contexts. Expansions, wherein the clinician follows the child's production with a model and a request for imitation as part of the training context are also used (e.g., if the child says "ball roll," a clinician could expand the utterance by adding grammatical morphemes such as progressive, auxiliary *be*, and definite article: "the ball is rolling"). Additional more 'naturalistic' (see Camarata 1996) elements are included as well.

For example, assume that a child's goal includes two word action-object semantic relations. The child and clinician are engaged in play activities that make use of toys that can be 'rolled' such as a ball, car, truck, train, toy tires, etc. In this approach the child would have some control of the toys and the clinician would model (and request for imitation) a number of different contingencies. The clinician could initiate the interaction by moving the car and prompting the child to produce "roll car." Alternatively, the child could initiate the action (by rolling the car) and the clinician model and prompt could follow the child's play engagement. Also, the model and prompt can be delivered following the child's verbal production of one or more elements in the target

structure (e.g. the child rolls a ball and says "roll," the clinician follows with "roll ball; say: roll ball."). Thus, milieu teaching includes delivery of a model and request for imitation as contingencies to a variety of child and clinician behaviors.

5.2 *Example of Clinical Interaction*

In this example, assume the setting and targets are similar to those described above for the example for incidental teaching: Paint brushes and papers have been placed in front of the child but the paints have been placed out of reach in plain sight.

> (5)   Clinician Let's paint a picture.
>   Child   (gestures to paints)
>   Clinician What?
>   Child   Paint.
>   Clinician Oh, you want the paint! Say, I want the blue paint.
>   Child   Paint, want paint
>   Clinician Yes, you want the paint. (gives paint to child) Here's the
>   blue paint; say: blue paint.

In this episode, the clinician reacts more directly to the child's production and delivers the model as an expansion of the child's initial attempt. This flexibility to respond to the child's attempt and deliver the model and imitative prompt is viewed as an important modification of previous intervention procedures (Fey 1986; Kaiser 1993).

5.3 *Pragmatic Aspects of the Intervention*

Because the clinician is free to deliver models and requests for imitation in a variety of contingent contexts, the pragmatic aspects of milieu teaching are much more diverse than either analog/didactic or incidental teaching procedures. That is, the clinician can be the initiator of the interaction (as in analog/didactic and incidental teaching), or can respond to child requests and/or questions. This flexibility allows for teaching episodes in divergent pragmatic contexts. Internal analysis of the teaching episodes themselves indicates that the delivery of models and requests for imitation are highly similar to the parameters described above for incidental teaching: the clinician overtly directs the child's attention to the target form and requests immediate imitation of the form. However, this internally consistent form is delivered in play settings initiated by the clinician or the child. Thus, the immediate pragmatic structure includes a model that is now more directly linked to the play setting and a request for imitation that closely follows the model.

5.4 *Relationship to Pragmatics of Generalization*

As with the procedures reviewed above (analog/didactic and incidental teaching), milieu teaching includes direct instruction techniques that are not used widely in the generalization or naturalistic learning context. That is, because it is built upon similar model and prompt foundations, milieu teaching shares a number of functional pragmatic characteristics with these approaches. But milieu teaching provides these teaching episodes in contexts that occur naturally. The underlying theory is that embedding the teaching episodes into the play contexts will result in a closer association between the learned targets and the generalization settings, and allow the child to more easily make the transition to using the targets outside of the teaching episodes (Kaiser 1993). As Bambara and Warren (1993) observe, true generalization to spontaneous language is rarely measured directly and requires training that is flexible (and that parallels the generalization context). Milieu teaching is designed to be flexible and to promote more rapid generalization.

6.   **Natural Language Paradigm**

6.1 *Description of the Intervention*

Although the natural language paradigm (Koegel *et al*. 1987) shares many of the features and theoretical origins of milieu teaching, the approach warrants more detailed discussion because it directly focuses on motivating children with autism to communicate. That is, the procedure was developed specifically to improve the language skills of children with autism. This is of interest for a review of the pragmatic aspects of treatment because the motivation for communication is not addressed directly in most intervention approaches (see Camarata *et al*. 1994). Koegel *et al*. (1987) recognized that children with autism are not motivated to communicate (or engage in social interaction at all) and also applied functional analysis technology (Carr and Durand 1985) to determine which aspects of parent-child interactions would be communicative, and builds upon these interactions to expand the child's language. The first step in natural language paradigm is to determine whether the child uses any social interactions whatsoever. In most cases, even children that are almost totally antisocial will display some use of communicative behavior (although these behaviors may not be the usual forms of social interaction, as in the social use of echolalia; Prizant *et al*. 1993). After determining when the child is using social interaction and in which contexts these interactions occur (and what forms they take), a plan is developed

to shape these productions into forms that are more useful and intelligible. The actual shaping includes the use of 'natural reinforcers' (that is desired objects in the play environment), and prompting.

This approach is distinct from analog/didactic, incidental teaching, and milieu teaching in a number of ways, but particularly regarding the nature of prompts: direct imitation is not used, rather the child is reinforced for attempting more appropriate forms. Thus, the shaping is designed to encourage replacement of appropriate linguistic forms for the often inappropriate communication (e.g. tantrums, self injury), rather than focusing on accurate direct imitation of the targets. Koegel and his colleagues have reported that this approach of reinforcing attempts is much more effective that prompting direct imitation in children with autism (see the review in Koegel, Koegel, and Dunlap 1996).

6.2 *Example of Clinical Interaction*

In order to complete natural language paradigm, the clinician must first complete a functional analysis (Carr and Durand 1985). After 'natural reinforcers' have been identified as well as potential social contexts wherein the individual child is most likely to be communicative, these elements are included in the intervention. For this example, assume that the child is motivated by painting activities, and does not engage in aversive behaviors while painting. However, also assume the child does not communicate while painting, indeed, assume that the child is reluctant to communicate. As in the examples above, the clinician sets up paintbrushes, paints, and paper, but in this case, the paintbrushes and paper are placed in front of the child while the clinician holds the paint.

> (6)   Child   (gestures to paint and grunts)
>   Clinician Paint! you want paint.

The clinician then delivers the paint and attempts to paint with the child. That may be the extent of trials in the first session. Subsequent sessions would include attempts to shape the child:

> (7)   Child   (gestures to paint and grunts)
>   Clinician Here it is, Paintbrush! What is it? Paintbrush!
>   Child   Paint.
>   Clinician Yes, paintbrush, here it is. (and gives brush to child)

In natural language paradigm, prompts and models are delivered (after verbal responses have been established). The interaction always includes delivery of the

desired object and prompting should not be so direct as to result in tantrum or aversive behavior by the child.

6.3 *Pragmatic Aspects of the Intervention*

One could argue that pragmatic skills are the underlying construct of this intervention; the goal of natural language paradigm is to unravel the nuances of the social skills of the individual with autism and through intervention modify these social skills so that they more closely match appropriate forms of interaction. Functional pragmatic analysis is the initial step in the intervention and is an ongoing integral part of the intervention plan. From a broader perspective, natural language paradigm represents a shift in focus from form to function which was brought about in large measure by Koegel's observation that teaching language form alone was not altering the interaction style of most children with autism. Rather, these children would use the learned forms (often reluctantly) under tightly controlled conditions, but were not sufficiently motivated to communicate when outside the training setting. Koegel then examined the social interaction of children with autism in order to determine how they could become motivated to use the forms appropriately. Thus, the 'pragmatics' of this intervention consists of meta-analysis and overtly training the child with autism to use the targets in appropriate contexts, and more importantly, to discontinue use of inappropriate behaviors to communicate.

6.4 *Relationship to Pragmatics of Generalization*

Because the goal of the natural language paradigm is to directly teach appropriate social skills in children with autism, much of the training is completed in the generalization setting. Although one could argue that the training includes didactic elements that rarely occur in the generalization setting, these elements are used to directly train the language skills in the generalized home context. Thus, there is a direct relationship between the intervention and the pragmatic aspects of generalization as these are the focus of the intervention.

7.   Conversational Recast

7.1 *Description of the Intervention*

Conversational recast intervention is based upon the rare event learning model

proposed by Nelson (1989). In this approach, the child is provided with indirect corrective feedback that is delivered immediately following their own productions (see the analysis in Moerk 1992). For example, assume the target is the auxiliary grammatical morpheme ("she is walking"). This treatment focuses on expanding the child's production to include the auxiliary (which the child is deleting in spontaneous speech). For example, if the child says "girl walk," the clinician would respond "yes, the girl is walking." No imitative prompts are delivered, rather the goal of treatment is to provide multiple examples of the target so that the child hears the expanded version immediately following his/her own attempts (Camarata *et al*. 1994; Nelson *et al*. 1996). The context for the intervention includes play materials that are selected by the child. The clinician will make available to the child (for selection) toys that are likely to elicit attempts of the targets during play interactions. Note that this approach is designed to be used with children who are already attempting to communicate using immature forms (i.e. who display at least rudimentary motivation for communication as the recasts are responses to child initiations).

7.2   *Example of Clinical Interaction:*

Once again, assume the treatment session is designed around painting activities and assume the targets are colors and two word combinations.

(8)   Clinician Let's paint a picture.
         Child   (gestures to paints)
         Clinician What?
         Child   Paint.
         Clinician Oh, you want the paint! Blue paint.
         Child   Paint, want paint.
         Clinician Yes, you want the paint. (gives paint to child) Here's the blue paint.

The clinician continues to play with the child and delivers recasts whenever the child initiates:

         Child   Paint!
         Clinician More paint! Red paint! Here. (gives more paint to the child)
         Child   I paint.
         Clinician Yes, with red paint.

7.3 *Pragmatic Aspects of the Intervention*

Conversational recast intervention differs from the approaches described above in at least one key aspect of the functional pragmatic characteristics of the procedures: recasts are exclusively delivered in response to child initiations. Because of this, the child has a more active role in the interaction as the clinician is following the child's conversational lead. In addition, this approach includes no direct prompting or requests for imitation. To be sure, play materials and clinician interactions are designed to indirectly elicit target attempts from the child, but these are quite different from a functional pragmatic perspective than the requests for imitation implemented within analog/didactic intervention, incidental teaching, and milieu teaching. Indeed, conversational recast teaching also does not include the types of prompting for social interaction included in natural language paradigm because the children examined within conversational recast do not require additional scaffolding for attempts at social interaction (as required in children with autism). Thus, the pragmatic characteristics of conversational recast include child initiations in play contexts followed by adult responses to these initiations. Because any initiation can be recast, a wide variety of pragmatic functions are observed in treatment sessions (e.g. statements, requests, descriptions, questions etc.).

7.4 *Relationship to Pragmatics of Generalization*

Conversational recast intervention is similar to the generalization context in a number of key aspects. First, the child is exposed to the targets in a variety of pragmatic contexts (as is the case in home settings). Indeed, the intervention is embedded in play episodes that are designed to closely parallel the description of natural language learning in parent child interactions (see Brown and Hanlon 1970, and Moerk 1992). Second, the child initiations are the trigger for delivery of recasts, such that the motivation, and attention of the child are an inherent part of the teaching episode (i.e. the child is engaged in play and is interacting positively with the clinician; see Haley, Camarata and Nelson 1994). Thus, it is not surprising that targets learned under conversational recast intervention generalize quickly across settings and across conversational partners (cf. Camarata *et al*. 1994) because the child is learning in contexts that are highly similar to the generalization learning situation.

8.   Whole Language

8.1 *Description of the Intervention*

Whole language intervention has arisen from an orientation to reading instruction (Norris 1990; Chaney 1990) and focuses on directly paralleling natural language acquisition. The goal of whole language instruction is to provide a supportive environment for communication, and language enrichment activities built upon 'themes' that are similar to everyday interactions in preschool settings (Hoffman, Norris, and Monjure 1990). These themes are often topic oriented, such as weather conditions, daily activities, and children's stories, rather than being goal oriented (as in the previous intervention types). Thus, whole language intervention closely resembles preschool activities for children without language disabilities and typically does not include a specific focus on language structure. There appears to be an implicit assumption that children with language learning disabilities do not require direct or indirect instruction on language structures, rather, additional nonspecific exposure to language will remediate the disability (Norris and Hoffman 1993).

8.2 *Example of Clinical Interaction*

Once again, assume the treatment session is designed around painting activities, but whole language typically includes global goals, such as increasing MLU (Norris and Hoffman 1993). A whole language session will include recasts (as these are a part of natural language interaction, Conti-Ramsden 1990), but will not include a focus on modelling, or recasting a particular set of language structures.

> (9)   Clinician Let's paint a picture. Today we are painting a horse.
>   Child   (gestures to paints)
>   Clinician Those are paints and we are painting the horse.
>   Child   Paint.
>   Clinician Blue paint. No, we should paint the horse brown. Here's
>   the brown paint.
>   Child   Paint, want paint.
>   Clinician OK, here's the brown paint, let's paint the horse.

The clinician continues to play with the child and talk about the activity.
   Child Horse.

>   Clinician Yes, a horse.
>   Child   Brown horse.

Clinician Now lets make a black one! Here's the black paint.
Child   More paint?
Clinician Yes, let's paint this one black.

The activity continues around the theme of painting horses.

8.3   *Pragmatic Aspects of the Intervention*

As in conversation recast, the focus of whole language is on social communication and includes pragmatically appropriate responses to the child. The actual instructional theme is selected by the clinician who guides the child through each of the planned activities (as in preschool settings), but a key element of the intervention is to be responsive to the child (Norris and Hoffman 1993). Thus, a pragmatic analysis of whole language intervention would yield a wide variety of communicative functions from the clinician and from the child, including topic initiation and maintenance, topic shifts, comments, responses, questions and answers, and recasts of the child's productions. Whole language approaches typically do not include prompts or direct requests for imitation (Hoffman *et al.* 1990; Norris 1990). Indeed, the goal of whole language is to provide a pragmatically rich communicative environment for the child (Norris and Hoffman 1993).

8.4   *Relationship to Pragmatics of Generalization*

The social context of whole language directly parallels the pragmatics of the generalization setting, being particularly close to the interactions often observed in preschool settings that focus on enrichment rather than on specific instructional materials. Because the interactions are embedded in conversational contexts, there is a close match between the pragmatics of the intervention and the generalization settings. Given this close match, one may wonder why this would not be the intervention of choice when remediating child language disability. Clearly, any skills acquired within intervention are highly likely to also be used outside the intervention setting. Indeed, one could argue that there is little difference between the intervention setting and the generalization setting, and therein lies a primary criticism of whole language approaches (Camarata 1996; Chaney 1990): If a child is having difficulty acquiring language without intervention, it is perhaps unlikely that simply duplicating what is occurring in the natural language environment will be sufficient to trigger language growth. An underlying assumption in the intervention methods presented previously is that the child with language disabilities requires specialized intervention support

to learn new language structures. As shown, the procedures differ with regard to the ways that the language goals are highlighted during intervention, but all provide planned support for specific language structures. In addition, because whole language methods lack specificity regarding language targets and deliver a wide variety of responses to the child, it is often difficult to determine which responses (if any) are associated with language growth. Thus, whole language intervention directly parallels the pragmatic parameters of the generalization setting, but may lack the focus on specific language structures that many children with language learning disabilities evidently require for learning. Consider the example above: the clinician provided potential teaching responses (e.g. recasting a definite article: "a horse"), but there are constant shifts in the forms recast, from grammatical morphemes (a horse) to semantic relations (blue paint) to complex sentences (those are paints and we are painting the horse). Perhaps this kind of constantly shifting response is difficult for the child to process (Nelson 1989).

9.   Conclusions

The above review indicates the wide diversity in the functional pragmatic characteristics of language intervention approaches for treating paediatric language disorders. On the one hand there are interventions designed to elicit multiple productions in very limited pragmatic contexts (analog/didactic). At the opposing end of the spectrum are interventions designed to directly parallel a broader variety of contexts (whole language, which includes no direct focus on language structure; conversational recast, which includes interaction designed to provide teaching responses within conversational contexts; and in terms of instilling social skills in children with autism, natural language paradigm). The middle ground is occupied by treatments that include prompts to highlight the language goals while also programming some flexibility in terms of context (incidental learning and milieu teaching). At this point in the development of these interventions, it is perhaps fair to say that all have demonstrated some levels of success in improving language skills and all have revealed weaknesses. A working hypothesis that emerges (see Camarata 1996) from an analysis of the interventions is that generalization will be more efficient for those approaches that are closer matches to the broader generalization context. This was seen in Koegel, Camarata, Koegel, Smith and Ben Tal (1998) who reported that targets acquired under analog/didactic intervention often failed to generalize (although there was generalization for some targets) whereas almost all targets acquired

under conversational recast intervention generalized rapidly. This replicated a similar report by Camarata *et al*. (1994) for grammatical targets.

Camarata (1996) has suggested that treatment be initiated using procedures that share as many pragmatic features as possible to the generalization context and add decontextualized (more restricted pragmatic contexts) and prompting support if the child demonstrates a lack of learning under the more pragmatically diverse treatment. Thus, a child may require natural language paradigm to acquire motivation for communication and basic social skills. Another child may only require conversational recast intervention to learn whereas a child failing under this approach may require the prompting support provided by milieu teaching, incidental teaching, or analog/didactic intervention respectively. Although current literature suggests that all approaches can be successful (and/or unsuccessful), incorporating pragmatic analysis of the intervention procedures may provide important insights on the most efficient methods required to establish target use (and language growth) in generalized spontaneous language. More importantly, future studies that systematically examine the pragmatic continuum may provide a unified therapy model that allows for the most powerful intervention to be applied to each individual with speech and language disabilities.

Acknowledgements

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