Toddler Talk: Outcomes from a Parent-Focused Intervention for Children with Speech/ Language Problems

Toddler Talk: Résultats d'une intervention axée sur les parents pour les enfants ayant des troubles de la parole et du langage

B. Robin Gaines & Isabelle Gaboury

Abstract

This paper describes the outcomes of a parent-focused, group based program for treatment of young children with speech and/or language delays, *Toddler Talk*. The program uses a consistent and user-friendly system of setting goals, Goal Attainment Scaling, in order to meet the varied clinical needs of the clientele. The speech and language profiles of a convenience sample of 211 children seen in the *Toddler Talk* program as well as their parents' report of their developmental skills are reviewed. Outcome measures showed that children who participated in *Toddler Talk* all displayed a growth in expressive vocabulary. Of note, a statistically greater increase in vocabulary score was observed for children beginning the program with more than 50 expressive words as compared with those children beginning the program with less than 50 expressive words. Use of Goal Attainment Scaling allowed families and clinicians to set goals and describe clinical progress on these goals; however, data analysis revealed that the goals set were not sufficiently challenging for all children entering the program. Correlation analyses did not indicate that a particular profile of developmental level was predictive of children's success in the program, in terms of vocabulary acquired or progress in goal acquisition. Results from a family satisfaction questionnaire revealed that the majority of parents felt that *Toddler Talk* met their children's and family's needs. Clinical implications of these findings are discussed.

Abrégé

Cet article décrit les résultats d'un programme de groupe axé sur les parents pour le traitement des jeunes enfants accusant un retard de la parole ou du langage. Baptisé *Toddler Talk*, ce programme est fondé sur un système homogène et convivial utilisé pour fixer des objectifs, le *Goal Attainment Scaling* [évaluation des résultats atteints], visant à répondre aux besoins cliniques de la clientèle. Cet article examine le profil d'un échantillon de commodité composé de 211 enfants ayant pris part à ce programme ainsi que le compte rendu de leur développement selon leurs parents. Les indicateurs de résultats montrent que les enfants ayant pris part au programme *Toddler Talk* avaient tous accru leur vocabulaire d'expression orale. Cette recherche fait ressortir que les enfants ayant commencé le programme avec moins de 50 mots avaient connu une plus forte augmentation de leur vocabulaire sur le plan statistique que les enfants ayant moins de 50 mots au départ. La *Goal Attainment Scaling* a permis aux familles et aux cliniciens de fixer des objectifs et de décrire les progrès observés en clinique. Toutefois, l'analyse des données a révélé que les objectifs fixés n'étaient pas assez élevés pour tous les enfants qui commençaient le programme. Des analyses de corrélation n'ont pas permis de cerner un profil qui pourrait prédire la réussite du programme auprès d'un groupe d'enfants particulier, que ce soit au niveau de l'acquisition du vocabulaire ou des progrès accomplis en vue d'atteindre les objectifs fixés. Les résultats d'un questionnaire sur la satisfaction de la famille ont montré que la majorité des parents étaient d'avis que le programme *Toddler Talk* répondait aux besoins de leur enfant et de leur famille. L'article aborde les conséquences de ces résultats sur la pratique.

Keywords: Toddlers; Preschoolers; Speech-Language Impairment; Parent-based intervention

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This article describes a group program, *Toddler Talk*, which targets the learning needs of young children with a variety of speech/language difficulties and incorporates a parent-focused format into its design and delivery. The program was specifically designed using current knowledge of intervention

techniques proven in the research literature for 'specific' clinical populations of toddlers including late talkers and children with phonological delays (e.g. Ellis Weismer, Murray-Branch, & Miller, 1993; Girolametto, Pearce & Weitzman, 1996, 1997; Lederer, 2001; Robertson & Ellis Weismer, 1999). These research reports show positive outcomes with programs designed for particular subgroups of children. In reality, speech-language pathologists (SLPs) are rarely afforded the opportunity to select "specific subgroups" of children to treat. More often, treating clinicians are faced with limitations in clinical resources and the increasing demands to see more children, with varied clinical profiles, in their daily practice. Thus, these real life clinical situations in which clinicians apply intervention techniques often differ substantially from the carefully controlled modules in which the techniques are tested by researchers. This means that conclusions about the efficacy of some interventions may not be necessarily true of the same interventions when they are used clinically. Since one of the ways in which many studies of research driven intervention and clinical practice differ is in the heterogeneity of the populations, research that examines the efficacy for varied populations is important. *Toddler Talk* is a program that serves a heterogeneous group of children, and hence an examination of its efficacy is clinically useful.

Given that the clinical setting requires that intervention be provided for children with varied speech/language needs, *Toddler Talk* uses a parent-focused format with individually specified goals. In order to examine the effectiveness of the intervention, a measure of clinical outcome was required. The *Toddler Talk* program incorporates Goal Attainment Scaling as a way to measure progress in a group intervention program. In addition, a measure of family satisfaction was provided to evaluate whether the program met the current needs of family participants.

The purposes of this program evaluation study were to evaluate the treatment efficacy of proven intervention techniques as applied to a clinical program, to examine the effectiveness of a parent intervention program with a heterogeneous population of children and to evaluate the effectiveness of an outcome measure, Goal Attainment Scaling, to measure the program outcomes.

Review of Literature

Research findings and evidence-based practice suggest that parent-focused interventions which use interactional models of language intervention with toddlers are effective in promoting speech and language development (Girolametto et al., 1996, 1997; MacDonald, 1989; Manolson, 1992; Wilcox, Bacon & Greer, 2003). These approaches acknowledge that family members have the most knowledge about their children and can serve as the best facilitators of communication development. When parents are taught how to model speech and language effectively for their child's learning, the benefits outside of therapy sessions can be maximized. That is, what a therapist can model within one treatment session, a parent can model repeatedly throughout the child's 10-12 hour day. *Toddler Talk* affords a unique opportunity to evaluate the effectiveness of a parent-child intervention program, in a clinical setting. In addition, it allows clinicians to evaluate whether these proven research techniques are 'ecologically valid' when applied in a program with a heterogeneous population of children.

Group intervention practices for 'specific' clinical populations of toddlers including late talkers and children with phonological delays (e.g. Ellis Weismer et al., 1993; Girolametto et al., 1996, 1997; Lederer, 2001; Robertson & Ellis Weismer, 1999) have proven efficacy in the research literature. When clinicians adapt research based interventions to clinical practice, questions arise concerning which children will be best suited for the clinical context of that intervention. One domain which possibly influences a child's progress in intervention is that of developmental level. Researchers have reported that communication and language development are highly correlated with cognitive development, including symbolic play and the understanding of cause-effect (Bates, Benigni, Bretherton, Camaioni & Volterra, 1979). Therefore, knowing something about the child's developmental skill levels may provide clinically relevant information that would impact upon the child's progress in a parent-child group. An issue for the evaluation of the 'best-practices' for toddlers involves evaluating whether children with varied developmental skill levels are able to have their needs met in a group based format such as *Toddler Talk*. Researchers (e.g., Wilcox, 1992) have also recognized that speech/language intervention is more effective when specific goals are targeted within therapy sessions. Goal setting can be learned quickly and provides an opportunity for ongoing feedback in the therapy process. In addition, the profession of speech/language pathology is being challenged to provide evidence of the immediate effectiveness of our treatments (Ellis Weismer, 2000). The call for evaluation and outcome measures is pushing the profession to look for ways to be accountable for our services.

One of the unique features of *Toddler Talk* is its use of Goal Attainment Scaling (GAS) (Kiresuk, Smith, & Cardillo, 1994), as a technique of goal setting, parent training tool and evaluation measure. As an outcome measure, GAS has been shown to have positive evidence of psychometric properties including: reliability (i.e., the degree to which the measure is free from errors of measurement), responsiveness (i.e., the power of the measure to detect a difference when one is present) and clinical utility (i.e., the ease of the measure to use and how well it is able to help clinicians formulate interventions) (Donnelly & Carswell, 2002). As a measurement tool, GAS has been shown to clearly define behaviors in quantifiable terms, thus allowing clinicians/researchers to reliably and objectively measure change in their clients. GAS appears to be a responsive tool as indicated by a study that showed that scores changed in conjunction with motor changes in delayed infants (Palisano, Haley, & Brown, 1992). The clinical utility of GAS has evolved over years as clinicians and researchers

modified its use to a practical one. In its earliest form, stringent use of the original GAS protocol dictated that goal setters must be independent of the treatment process and individuals must be randomly assigned to different treatment modalities (Cytrynbaum, Ginath, Birdwell, & Brandt, 1979). Modifications to original GAS procedures have made it clinically useful since employment of an independent goal setter and random assignment to treatment groups were impractical. When GAS is now completed in collaboration with a client it is viewed as client centered (Donnelly & Carswell, 2002) and program outcomes can be evaluated without random assignment procedures (e.g., Glaser & Backer, 1980). In addition, GAS allows for individualization of goals, quantification of individual outcomes (Malec, Smigielski, & DePompolo, 1991), and comparison across individuals. One of the most important aspects of GAS is that it allows clinicians to be sensitive to the needs of each individual in therapy (Heavlin, Lee-Merrow, & Lewis, 1982; Seaburg & Gillespie, 1977). Individual goals are set in which the outcome is clear and behaviorally defined. The goal setter is responsible for assessing the client's current status and working collaboratively with the client to set desirable goals. Clinicians make an effort to set goals that are developmentally appropriate and have meaningful outcomes that can be measured (Donnelly & Carswell, 2002). Clinical training and practical application are both required for effective use of goal setting (Choate, Smith, Cardillo, & Thompson, 1981).

In this program evaluation, a post-hoc analysis of the group data was conducted to ask four clinically relevant questions. First, are children in a mixed group program, *Toddler Talk*, benefiting from the intervention? Second, how effectively is the system of GAS working to set and evaluate children's progress in the program? Third, is there descriptive developmental information that can help clinicians predict a child's progress in the *Toddler Talk* program? Finally, do the families who participated in *Toddler Talk* value the program and report that the GAS system was an effective measure of intervention goals and progress?

Method

Program Description

Toddler Talk is a group based parent-child intervention program offered to families on a regular basis through the First Words Preschool Speech and Language Program and the Children's Hospital of Eastern Ontario, Ottawa, Ontario. A single *Toddler Talk* program is completed within a 12-14 week period, which includes 8 weekly play-based group sessions and 2 parent workshops. An evaluation component is incorporated as part of the *Toddler Talk* program, through a pre- and post-program evaluation. The program is community based and is held in child-care and nursery school settings. Depending upon the size of the program setting, between 6 and 8 parent-child pairs are invited to participate in each *Toddler Talk* program.

Participants

Children were accepted into the *Toddler Talk* Program who were less than 3 years 6 months of age and whose speech/language assessment profile indicated one or more of the following difficulties: receptive and/or expressive language delay, phonological delay/disorder, mild/moderate delay in symbolic play development, and mild/moderate delays in social interaction skills. In addition, the children's caregivers all indicated their availability for regular attendance in the program.

Procedure

Group Sessions. Each 1-1/2 hour group session is organized around a theme, selected from a developmentally appropriate storybook. Efforts are made to utilize the theme throughout each group session. A set of core vocabulary central to the theme is incorporated into each session plan. For example, the theme for *I Went Walking* (Williams & Vivas, 1989) incorporates play with the key farm animals from the story, an animal painting craft activity, the Old MacDonald song and animal shaped snacks. A series of key elements are planned for each *Toddler Talk* group including: guided play at learning centers, a time during which the children explore through play (symbolic, combinatorial and sensory play activities as well as oral motor activities), story time, song or musical activity, finger play or gross motor transitional activity, snack (picture exchange activity), and craft or sensory activity.

Within each *Toddler Talk* group session, the SLP and early childhood educator demonstrate the intervention techniques, modeling for parents how to work with their children. Demonstrations occur in the group context as well as during one-on-one interactions with a child. The service providers coach the parents about how to apply the principles during activities and play with their children. In this way, parents are taught, shown, and coached on how to stimulate and promote speech and language development, while teaching goal specific behaviors with their children. The GAS helps organize and focus the intervention process for both the parents and service providers.

A focused stimulation intervention technique is the primary intervention technique applied by parents and clinicians. Focused stimulation (Girolametto et al., 1996, 1997) involves creating repeated motivating opportunities for a child to produce a targeted utterance. Mand model (Rogers-Warren & Warren, 1980) is the secondary intervention technique applied in specific group interactions. For example, a picture exchange is required for snack time (to request juice and theme-based snack); in addition, situations are 'set up' during activities with opportunities for the child to "mand" the missing item (e.g. art activities without required materials; bubble containers without wands). Additionally, through environmental manipulations and clinician/parent-created opportunities, children are enticed to use their communication in

'temptation' based situations (e.g. Wetherby & Prizant, 1989). All of these intervention techniques have demonstrated clinical effectiveness in the literature (Fey, 1986; Paul, 1995) and are applied in the context of natural interactions with the parent and child in play.

Parent Workshops

Two 1-1/2 hour parent workshops are also built into the *Toddler Talk* program. In the workshops, parents receive feedback to help them understand their role in helping their child accomplish the specific goals. The first workshop is held before the group sessions begin; the second workshop is conducted mid-treatment. The workshops provide parents with information about developmental expectations for toddlers, general interactional techniques known to increase speech/language development, and the use of GAS. Both workshops are geared to helping the families adapt the general knowledge to their child's specific needs. For example, in the second workshop the parents practise role playing intervention scenarios within the clinical environment (nursery or child care room), keeping their child's goals and play interests in mind.

Pre-Program Evaluation

Pre-program evaluations are collected at the child's entry into the group program. *The MacArthur Communication Development Inventory* (MacArthurCDI) (Fenson et al., 1993) is used as a measure of expressive vocabulary. This measure was chosen because previous research reported changes in the children's expressive vocabulary through parent-child intervention programs. The *Child Development Inventory* (CDI) (Ireton, 1992) is collected as a measure of developmental levels, in order to have descriptive information about the children participating in the program. Both measures are parental report. In addition, at a pre-program evaluation session, the SLP meets each family and assists them with the identification of their child's learning needs. Through their collaboration, they mutually plan goals for the child's development. GAS is used to define behavioral objectives.

Goal Attainment Scaling (GAS)

GAS defines behaviors that a child does not have in his/her repertoire (current skill level) and describes clear steps requisite to achieving the defined goals. This approach enables clinicians to be sensitive to the family's needs and determine clinically functional goals for individual children. For example, for one child a realistic goal may be the addition of 10 words to his/her vocabulary, whereas for another child the addition of 50 or more words may represent a significant change. Review of the goal attainment scales throughout the family's participation in *Toddler Talk* provides opportunities for ongoing feedback with respect to parent models and child progress. For each child, the SLP defines a few goals to target developmentally appropriate gains in the following areas: social-pragmatics (e.g., communicative intentions), play (e.g., functional and symbolic play), receptive language development (e.g., understanding vocabulary), expressive language development (e.g., gestures, vocalizations, verbalizations), and speech production (e.g., oral motor awareness, phonological development).

At goal setting, the SLP develops a GAS measurement scale based upon the child's present profile and the child's predicted clinical growth during the intervention program. A 5-point measurement scale is defined such that –2 describes the child's current skill level. The target behavior is 0, which the SLP and parent predict can be achievable for the child during this intervention (expected progress). A +2 is the much more than expected level of outcome. For each family, a maximum of 3 goals is determined. Efforts have been taken to make each step of the GAS scale equivalent in difficulty to the next. The format of GAS is presented in Figure 1. Examples of Goal Attainment Scales used in *Toddler Talk* are included in Appendix A.

Figure 1.

	GAS-Behavioral Description of Target Goal
	-2) Child's baseline skill
	-1) Small improvement towards goal
***	0) TARGET Goal
	+1) Increment above Target
	+2) Achievement Exceeds Expectations

Each SLP who is implementing the *Toddler Talk* program for the first time has received training in the intervention approaches and the procedures of GAS. For GAS training, an individual instructor trains a single clinician in a two stage training process as recommended by Choate et al. (1981). In the first stage, the clinician is given information about the rationale for GAS. Procedures for isolating therapeutic goals are discussed (i.e., exploring parents' concerns and identifying area(s) to focus on), the process of developing and scaling goals is explained, and the concept of an expected level of outcome for a planned program of treatment is introduced. Specific clinical examples of children attending *Toddler Talk* are provided and clinicians are referred to a GAS 'inventory,' which currently consists of a list of 85 documented goals from which a clinician may chose to either select an appropriate goal for a toddler, modify a written goal and/or create a new goal. The merits of GAS as an evaluative instrument with therapeutic advantages are emphasized. In the second phase, the clinician meets with a referred child and family to establish projected treatment goals and to determine the expected level of outcome for each goal. Goals are then reviewed with a mentor and revised if needed. When the SLP has set goals for all children due to enter a *Toddler Talk* program, implementation of the program proceeds with a mentor as lead clinician for parent workshops and the group context.

The actual amount of time required for this training process varied from 18-25 hours, occurring over several weeks. Maintenance support is available on an as-needed basis and clinicians use this as required.

Post-Program Evaluation

An individual post-program evaluation is completed with each family at the end of the *Toddler Talk* program, usually within two weeks of program completion. In the post-program evaluation, two measures of outcome are collected. First, the MacArthurCDI (Fenson et al., 1993) is completed to record the child's expressive vocabulary. Second, the SLP rates the child's scores on the GAS in order to document the child's progress in the *Toddler Talk* program. Clinically, the individual GAS scores are used to provide feedback to families and to plan for further intervention services. In addition, the child's clinical profile is described based on speech/language assessments, clinical judgment and observation of the child's progress in the program. Clinicians use a variety of clinical tools to make clinical judgments regarding the category which best describes the child's speech/language profile at the child's completion of the *Toddler Talk* program. The following categories are used: expressive language delay, phonological delay, receptive language delay, symbolic/pragmatic delay, dysfluency, and multiple combinations of these categories. Clinicians also make a clinical judgment about whether the child has any oral motor planning/sequencing difficulties.

At the completion of each *Toddler Talk* program, every parent is asked to complete a survey of their satisfaction/dissatisfaction with the program, rating their level of agreement with a series of 20 statements. A copy of the survey is presented in Appendix B.

Data Analysis

Analysis of the individual and group Goal Attainment Scales is completed after a child completes *Toddler Talk*. For research purposes a T-score is obtained, as recommended by Kiresuk and Sherman (1968). First, the individual scale scores are summed. For example, if a child had three goals for his *Toddler Talk* program, and the level of outcome was the –1 level (somewhat less than expected level) on the first scaled goal, at the "expected" level (0) for a second goal, and at the "much more than expected" level (+2) for a third goal, then the sum of the individual scale scores would be: (-1) + (0) + (+2) = +1. This score is compared with T-tables and a T-score is obtained.

In order to assess whether the mean T-score had a normal distribution with a mean of 50 and a standard deviation of 10 (these are the parameters of a normal GAS T-scores distribution (Kiresuk, Smith, & Cardillo, 1994), the Kolmogorov-Smirnov goodness-of-fit test was used. This non-parametric statistical test determines if a sample comes from a population with a specific distribution. Correlation coefficients between number of words acquired (MacArthurCDI), GAS T-score and CDI were generated using Pearson correlations. Based upon clinically relevant observations in the research data (e.g., according to Fenson et al. (1993), a vocabulary burst is expected after acquisition of the first 50 words), a subgroup analysis was run for both groups of toddlers who had a MacArthurCDI score at the pre-evaluation of less than 50 words and more than 50 words. A Wilcoxon Signed Ranks test was used to compare the two subsets of participants with respect to the number of words acquired. All reported p-values are two-sided and were declared statistically significant when they reached a 0.05 probability level.

Results

This study reports data from a convenience sample of 211 children who completed their first *Toddler Talk* program, over a 3-year period. The data reflect a total of 41 *Toddler Talk* programs, facilitated by a total of 8 SLPs and 3 early childhood educators. Participants were between 20 and 42 months, with a mean age of 31.42 months (3.61 standard deviation (SD)). The diagnostic information, based upon clinical report by the SLP facilitating each program, is summarized in Table 1. In addition, the clinicians' judgment regarding the child's oral motor skills helped to classify the child with or without an oral motor weakness (e.g., drooling, oral motor planning or sequencing difficulties). A total of 38 (18.5%) children with phonological delays also presented with oral motor weaknesses.

Table 1
Diagnostic Profiles of Children in Toddler Talk.

Profiles of Children (n = 205)	n (%)
Expressive language and phonological delay	103 (50.2)
Expressive language delay (only)	30 (14.6)
Receptive, expressive, and phonological delay	19 (9.3)
Phonological delay (only)	17 (8.3)
Receptive, expressive delay	17 (8.3)
Receptive, expressive, phonological, and symbolic/pragmatic delay	11 (5.4)
Receptive, expressive, and symbolic/pragmatic delay	7 (3.4)
Receptive delay and dysfluency	1 (0.5)

The general development score on the CDI (Ireton, 1992) reflected a range of global cognitive skills. The overall score of general development (a composite score of the child's skills in self-help, gross motor, fine motor, expressive

and receptive language, and academic skills) revealed a range of skills extending from an 18 month delay (negative) to a positive developmental level of 6 months. As expected due to the range of skills sampled by the CDI, many children displayed a delay. For the entire sample, the mean delay was 5.29 months (3.62 SD) on the CDI scale. Only 10 participants (5.26%) had parental report scores which indicated positive developmental scores.

A comparison of the children's vocabulary on the MacArthurCDI pre- to post-intervention was available for 192 participants. The median change vocabulary score was 92.5 words, with a broad range of in number of expressive vocabulary words acquired (between 0 and 494 words). There was a statistically significant (although weak) correlation between the gain in vocabulary words and the toddler's CDI score ($r = 0.173$, $p = 0.029$).

In our sample, 142 participants (74.0%) had a pre-MacArthurCDI score greater than 50 words, while the remainder had a MacArthurCDI score of 50 words or less. A subgroup analysis of toddlers who had pre-MacArthurCDI scores less than 50 words and toddlers with more than 50 words reveals that those who had a MacArthurCDI score greater than 50 words at the beginning of the program were significantly more likely to acquire more words during the course of the program ($p < 0.001$). On average, toddlers in the less than 50 words group came into the program with 20.78 words (15.28 SD, range 2-49) and 215.66 words (127.33 SD, range 52-593) for the other group of toddlers. The mean number of words acquired by a toddler with more than 50 words at the start of the program was 129.21 (89.78 SD) as compared to a mean of 71.12 words (91.52 SD) for a toddler with a vocabulary of less than 50 words at the start of the program.

When one reviews the individual data points on Figure 2, of note are 12 children who do not fall within the box plots. These children presented patterns of vocabulary acquisition which do not follow the pattern of the groups. In both groups, these children present outstanding results. This finding might be explained by the fact that the outliers either had more than 50 words at the beginning of the program but did not show the rapid vocabulary acquisition expected, or had fewer than 50 words and showed dramatic increases in expressive vocabulary. We also observed more homogeneity within the group who had less than 50 vocabulary words at the beginning of the program, suggesting that these children are more likely to evolve similarly as a group, when compared to the group of children with more than 50 words at the beginning of the program, who presented with a more unpredictable pattern of vocabulary acquisition.

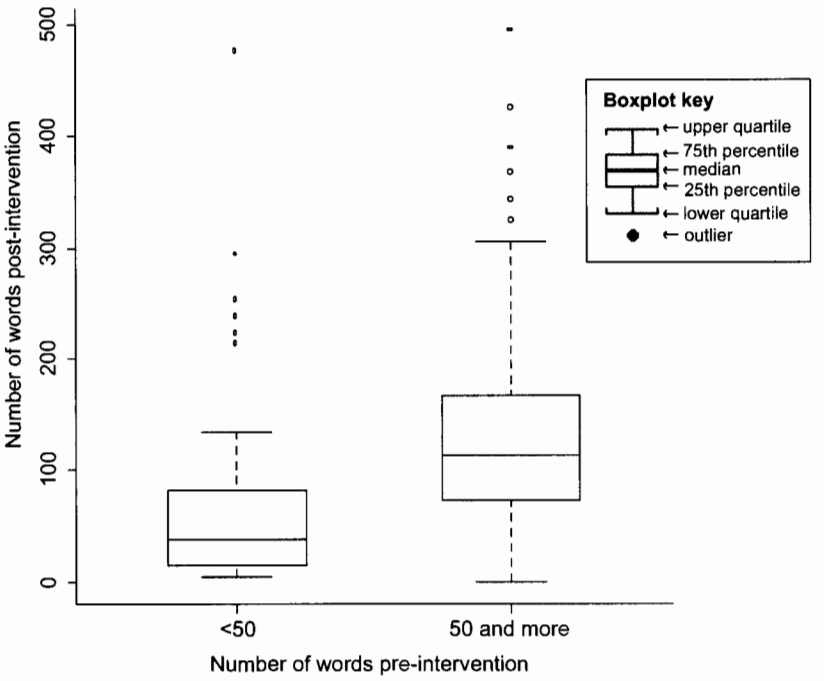

Figure 2. Distribution of post MacArthurCDI for both groups

A goal attainment score was obtained for all participants. The mean T-score was 58.62 (11.89 SD), ranging from a minimal value of 27.18 to a maximal value of 77.38. The T-score distribution is shown in Figure 3. The Kolmogorov-Smirnov test demonstrates that the distribution was significantly different ($ks = 0.395$, $p < 0.001$) than a normal distribution of mean 50 with a standard deviation of 10, indicating that the sample of children represented a skewed distribution of children, with many children exceeding their established goal targets. GAS T-score and CDI were found to be significantly correlated according to Pearson correlation coefficient ($r = 0.223$, $p = 0.002$).

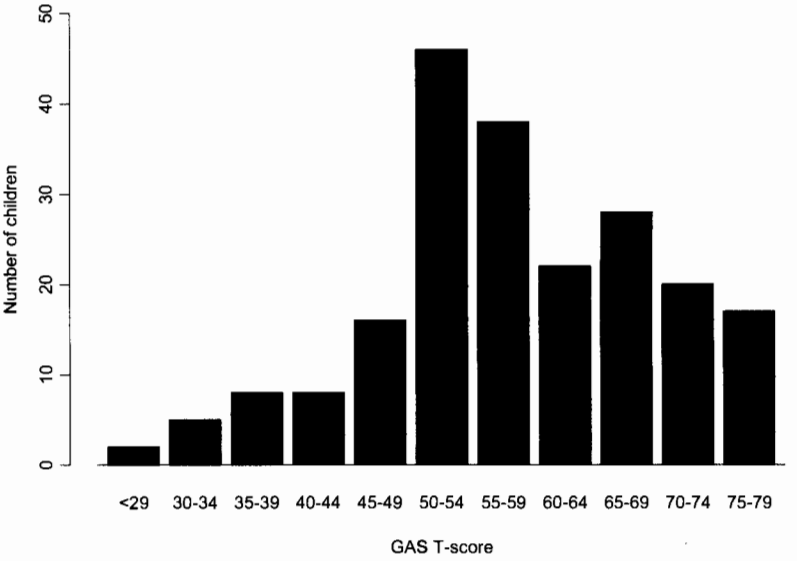

Figure 3. GAS T-score distribution

Survey Results

Overall, the satisfaction with the *Toddler Talk* program of 159 parents (73.4%) who answered the survey was largely positive. Three specific questions were analyzed to evaluate parents' perception of their child's improvement and the impact of the *Toddler Talk* program on that improvement (question 19), the GAS (question 14), and parents' abilities to continue to apply the techniques and strategies learned in the program (question 10). The majority of families (82.4%) reported that their child made improvement directly as a result of the *Toddler Talk* intervention, while a small proportion of families (12.7%) presented a neutral opinion on this statement. The majority of families (87.3%) reported that the GAS helped them understand their child's goals and the progress their child made towards achieving these goals. Parents overwhelmingly recognized that they had acquired the necessary skills to carry on with the strategies and skills learned through the *Toddler Talk* program (93.2%).

Discussion

This paper reports the outcomes of the *Toddler Talk* program and indicates the treatment efficacy of a parent-focused group intervention model of service for children with speech and/or language delays. As evidenced by the diversity of clinical profiles of the child participants, the children who attend the *Toddler Talk* program represent a heterogeneous group of speech/language delays, as well as a range of general developmental levels.

Vocabulary growth scores following intervention reported in the literature indicate variability. Given the larger number of participants reported in this study, our findings reflect one of the larger accumulations of participant outcomes in group treatment programs of this kind. A review of the literature indicated that Lederer (2001) reported the outcomes of 10 late talking toddlers selectively sampled from a pool of 30 children participating in 5 toddler groups, Robertson and Ellis Weismer (1999) reported findings of 11 late talking toddlers who were randomly assigned to a treatment group, and Girolametto et al. (1996) reflected data from 25 children. According to the literature, there is a wide range of vocabulary acquisition in group programs. Lederer (2001) and Robertson and Ellis Weismer (1999) both reported a mean vocabulary increase of 36 words (range – 16-75 words) for 10 weekly small group sessions (Lederer) and 12 weeks of biweekly separation groups (Robertson & Ellis Weismer). Girolametto et al. (1996) reported a mean growth of 150 new words for a 16 week program. Our sample had an average increase in expressive vocabulary of 112 words over 12-14 weeks. This rate of acquisition more closely approximates that found by Girolametto et al. (1996) than the other studies.

When evaluating the data, a factor that appears to influence vocabulary growth in the program is the vocabulary size at the beginning of the treatment. Fenson et al. (1993) reported that once children have a minimum vocabulary level of 50 words, a large vocabulary burst can occur. This finding explains a portion of the wide variability in our sample because toddlers who started the program with more than 50 expressive words increased their vocabulary by significantly more words (mean=129.21; 89.78 SD) than toddlers with a vocabulary of less than 50 words (mean of 71.12 words; 91.52 SD). The data for the toddlers with larger vocabularies at the beginning of the program resemble the results reported by Girolametto et al. (1996) and appear to be consistent with their findings.

As with any large heterogeneous clinical sample, there are children who may not fit with the typical patterns of the group. In our sample, 12 children were identified as outliers from the group. The clinical files of these children were reviewed in order to better understand their progress, as reported by parents on the MacArthurCDI. This subgroup of children included 2 two children who showed signs of severe motor planning difficulties which were suggestive of developmental apraxia of speech. These were the children who made no change in spoken vocabulary during the program despite parents reporting initial vocabulary scores of greater than 50 words. The remaining 10 children demonstrated huge changes in vocabulary scores. These children included two profiles: 1) late talkers who experienced a rapid blooming in spoken vocabulary during the program and 2) some children whose parents did not recognize the full scope of their child's vocabulary at the beginning of the program (either because of phonological weaknesses or limited awareness of parents).

Of interest are the T-score findings which indicated highly successful accomplishments of the Goal Attainment Scales set, collaboratively with families, by the SLPs. First and foremost, the fact that the children are achieving success with the targeted goals recommended by the SLPs is clinically important. When families commit their time, energy and efforts to an intervention program the recognition that their involvement has proved fruitful is extremely important (Dunst & Trivette, 1987). Second, there is recent evidence that the model of intervention offered in *Toddler Talk* (i.e., an eclectic presentation of individual parent-clinician consultation; parent training in adult education groups as well as group parent-child learning groups), has proven efficacy in its outcomes (Wilcox, Bacon, & Greer, 2003). These positive findings are rewarding, given that the *Toddler Talk* model of service delivery is based upon research describing good practice for intervention with toddlers.

In considering the T-score findings, it is notable that there is a skewed distribution of more positive success than expected with the GAS results. Several possible explanations exist. First, it is possible that a portion of the children enrolled in *Toddler Talk* may have been "watch and see" children or children who could be expected to 'outgrow' a speech/language delay. The clinicians facilitating *Toddler Talk* programs make every effort to be informed and current in their knowledge of research information regarding the positive predictors of speech and language change and the risk factors for delays (e.g., Olswang, Rodriguez & Timler, 1998); however, competent clinicians may over-accept

children into therapy programs when there are family factors which suggest 'red-flags' for a child's progress. For example, when a caregiver is highly stressed about his/her child's mild-moderate delay in language, a SLP may err on the side of caution and accept that child into the program. In the end, these children may 'bloom' in *Toddler Talk* thereby positively skewing the GAS scores.

A second explanation for the positively skewed T-score results is that the present study utilized treating clinicians in both roles of goal setter and evaluator. Indeed, there is evidence in the literature that the skewed T-scores may be partly due to this person being one and the same. When the GAS scoring results of treating therapists are compared with non-treating therapists, treating therapists were found more likely to rate children as functioning at expected outcome levels than non-treating therapists (King et al., 1998; Palisano et al., 1992). Therefore, evidence exists that therapists may systematically underestimate expected outcomes. In our program this may be the case. To improve the quality of goal-setting by SLPs in *Toddler Talk*, we are currently developing a guide for decision-making to further assist clinicians in setting clinically meaningful and functionally achievable goals for toddlers at differing stages of speech/language development.

A third possibility may be that the SLPs were not adequately prepared to use GAS. GAS is infrequently used by SLPs as an outcome measurement, suggesting that this form of behavioral measurement system is less familiar to SLPs. In an effort to identify how frequently GAS is used in the clinical literature, a search of the publications using GAS between 1982 and 2003 was conducted. A total of 94 articles were identified. The most frequently occurring references were in journals which report results in the fields of Nursing, Occupational Therapy, and Physiotherapy. Only two references were noted to include reference to the field of Speech-Language Pathology (King et al., 1998; King et al., 1999). In these studies, Speech/Language Pathology was involved as one component of intervention with school-aged special needs children. In both studies, GAS was used to target speech sound production errors in the context of conversational speech for children (total number is 19 children for both studies) with mild and moderate articulation errors. To our knowledge, there is no study reporting use of GAS for toddlers presenting with communication delays. The paucity of literature in Speech/Language Pathology indicates that this tool is in its infancy in the field. As increased pressure is put on SLPs to document their goals and demonstrate proven outcomes, further investigations of GAS as a means to achieve these results are needed. In Speech/Language Pathology, a recent surge in the search for outcome measures has led to the development of national outcome measures (e.g. ASHA, 1997), although the rigorous review of these measures may lag behind their implementation in clinical settings (Thomas-Stonell, McConney-Ellis, Robertson, & Oddson, 2003). Given the successful application of GAS in other clinical fields and its proven efficacy, it would be beneficial for SLPs to consider GAS as a responsive and clinically useful tool to evaluate intervention outcomes.

The significance of the correlation analyses requires consideration. Although we found through statistics that the CDI developmental scores correlated with children's progress on the MacArthurCDI and the GAS T-scores, this finding should be interpreted with caution. It is the case that the square of the correlation coefficient can be interpreted as the percentage of variability explained in both GAS T-score and MacArthurCDI. Both correlation coefficients between these outcomes and CDI were statistically significant, but small. Since a correlation of 0.5 means that 25% of the variance is explained, coefficients smaller than 0.5 are not considered clinically significant. Our findings suggest that the children with varying developmental skills are able to have their needs met in a group based format such as *Toddler Talk*. The data also suggest that an intervention modality, which uses a parent-focused format with individually specified goals, can handle a variety of children and provide successful outcomes.

Limitations

This article presents a program evaluation detailing how research findings can be incorporated into clinical practice. As primarily a clinical endeavor, there are limitations to this study. First, the data are presented for a convenience sample of children participating in the *Toddler Talk* program over a three year period. There are no control subjects by which to compare the findings. Given this situation, one cannot interpret the children's growth in vocabulary and acquisition of targeted goals as due solely to the intervention module. Other external variables such as developmental maturation were operating for these children. In the future, studies which compare progress of children on the wait list for services with those receiving parent-focused group intervention would prove useful. A second limitation to the study is the absence of a more consistent approach for collection of pre-program speech and language profiles of child participants. Clinically, more in-depth assessments of these children were completed prior to their referral to the *Toddler Talk* program, but no attempt was made to systematize the assessment tools and the clinical profiling of the children. For this reason, the only standardized pre-post program evaluation measures reported on were the MacArthurCDI and the CDI, both parent report questionnaires. In a true research project the assessment protocol for the children would be controlled, so that researchers would be able to compare the clinical profiles of children in more detail than we have been able to do in this study.

This program employs GAS as a way of setting goals and monitoring progress; however, there was a flaw in the technique used to set goals. Ottenbacher and Cusick (1990) recommend that the person who sets the goals should not be the same person who provides treatment. Clearly, in clinical practice with a family-centered focus and rising caseload numbers, this is a luxury that may not be feasible. In future *Toddler Talk* programs we will explore the possibility of controlling for clinician bias by video sampling

a child's behavior and having a non-treating clinician score the GAS outcomes, following completion of the program.

Implications for Clinical Practice

In this paper we have shown that a clinical intervention module designed based upon research studies of effective intervention for specific populations of toddlers can be successfully applied to a heterogeneous group of children with speech/language difficulties. This parent-based group intervention has demonstrated 'ecological validity' in the clinical setting. Clinicians who apply group based interventions that resemble *Toddler Talk* to their practices can feel confident that they are utilizing 'best practices' in serving their clientele.

We have also shown that GAS can be a clinically useful tool to define speech/language goals and evaluate outcomes for clinicians and families within the context of a group intervention program. In order to sustain this measurement tool as an ongoing component of an intervention program, several issues must be considered. According to a comprehensive case study of 10 programs that used GAS in service delivery, Glaser and Backer (1980) reported that programs able to maintain and sustain the system of GAS in program evaluation had the following characteristics:

1) The GAS system was well integrated into the standard operating practices of the organization (i.e., it is part of the program).

2) The program that uses GAS met a real, well-defined need in the service delivery system and that program was acknowledged by the agencies' leadership as valuable and integral to the service.

3) The GAS program survives when modifications in its implementation were allowed to progress (i.e., changes to the program evolve to meet best practice information, as it emerges in the field).

4) Staff values, particularly about evaluation, are congruent with those that GAS represents (i.e., staff perceive the importance of individual goals and monitoring outcome of the goals).

5) GAS programs survived when there was internal enthusiastic support, with an individual in the program who advocated and supported staff in the use of the GAS system (i.e., a consultative instructor/mentor is available for formal training and ongoing GAS support).

6) Efforts in planning and implementation of GAS involved staff in discussing pros and cons of the implementation of GAS so that potential problems can be dealt with constructively and so that staff can feel a sense of ownership with the program.

All of these generalizations have implications for those considering the implementation of a Goal Attainment Scaling program in a service delivery setting. One can infer relatively concrete suggestions from these statements and project the types of organizational conditions which are required before implementation of GAS in any SLP program should be considered. For example, any newly or clinically revised program should have program outcomes, such as GAS, built into its structure. In this way, clinicians will be able to collect ongoing information about the program and its merits. Another recommendation would be to have one person responsible for the overall program evaluation component of the program, thereby providing a resource for training, problem-solving, ongoing support, and data management of the GAS outcomes. Suggestions like these will help make a GAS program have clinical utility and longevity in practice.

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Appendix A: Examples of Goal Attainment Scales

Example GOAL: Peter will add the prepositions in/on to his expressive phrases (e.g. in box, ball in box, cup on table).

-2) Peter's phrases do not include in/on
-1) Peter says phrases that occasionally include in/on
*** 0) Peter says phrases that appropriately include both in/on
1) Peter says phrases that include in/on and one other preposition (e.g. under, behind)
2) Peter says phrases that include in/on and two other prepositions.

Example GOAL: Sarah will use possessives, with /s/ in final word position (e.g. cow's nose; mommy's shoe).

-2) Sarah does not mark possessive nouns (noun + 's)
-1) Sarah inconsistently uses possessives, with some one-syllable words
*** 0) Sarah uses possessives (noun + 's), in most words one-syllable words
+1) Sarah uses possessives (noun + 's), for most one syllable words and occasional multi-syllable words
+2) Sarah uses possessives (noun + 's) for both single and multi-syllable words.

Example GOAL: Michael will increase his expressive vocabulary, presently at 25 words, on the MacArthur Inventory.

-2) No change in Michael's expressive vocabulary.
-1) Michael's expressive vocabulary increases by 3 words.
*** 0) Michael's expressive vocabulary increases by 6 words.
+1) Michael's expressive vocabulary increases by 9 words.
+2) Michael's expressive vocabulary increases by 12 words.

Appendix B: Toddler Talk Evaluation

Parents: Please read each statement carefully and mark your personal opinion regarding its content. Please feel free to add any additional information. We are hoping to learn from this evaluation!

1) The time offered for *Toddler Talk* was convenient.	☐ I Agree	☐ I Disagree	☐ No Opinion
2) Parking was adequate at the *Toddler Talk* site.	☐ I Agree	☐ I Disagree	☐ No Opinion
3) During the *Toddler Talk* program I clearly understood my child's speech/language goals.	☐ I Agree	☐ I Disagree	☐ No Opinion
4) My child enjoyed the books used within the program.	☐ I Agree	☐ I Disagree	☐ No Opinion
5) The day offered for *Toddler Talk* was convenient.	☐ I Agree	☐ I Disagree	☐ No Opinion
6) I learned from the ways in which the Speech-Language Pathologist modeled with my child.	☐ I Agree	☐ I Disagree	☐ No Opinion
7) My questions were answered well in the *Toddler Talk* program.	☐ I Agree	☐ I Disagree	☐ No Opinion
8) The *Toddler Talk* site was easy to get to.	☐ I Agree	☐ I Disagree	☐ No Opinion
9) My child is attempting to communicate more than he/she was at the beginning of the program.	☐ I Agree	☐ I Disagree	☐ No Opinion
10) I feel confident that I know what I can do to help my child learn to communicate.	☐ I Agree	☐ I Disagree	☐ No Opinion
11) The speech/language pathologist identified speech/language goals which were appropriate for my child.	☐ I Agree	☐ I Disagree	☐ No Opinion
12) My child and I found the toys/materials clean and fun.	☐ I Agree	☐ I Disagree	☐ No Opinion
13) Within the guided free play time, there were enough activities to sustain my child's interest.	☐ I Agree	☐ I Disagree	☐ No Opinion
14) The 1-5 GOAL scaling helped me understand my child's goals and progress.	☐ I Agree	☐ I Disagree	☐ No Opinion
15) I found the home activities easy to apply.	☐ I Agree	☐ I Disagree	☐ No Opinion
16) The home activities motivated my child.	☐ I Agree	☐ I Disagree	☐ No Opinion
17) I learned new information in the parent sessions.	☐ I Agree	☐ I Disagree	☐ No Opinion
18) The parent sessions gave me a chance to ask questions.	☐ I Agree	☐ I Disagree	☐ No Opinion
19) My child's speech/language skills have improved, as a result of *Toddler Talk*	☐ I Agree	☐ I Disagree	☐ No Opinion
20) My child is more comfortable within a group setting, than he/she was before beginning *Toddler Talk.*	☐ I Agree	☐ I Disagree	☐ No Opinion

Please tell us what you liked best about *Toddler Talk.*

Please tell us what you would suggest as a change or addition to *Toddler Talk.*

Any other comments?

Thank you for the time you've taken to complete this evaluation.