

RUNNING HEAD: PARENTAL SYNTACTIC COMPLEXITY

Parental Syntactic Complexity and Children's Observed Behavior in Communication about
Children's Recent Cancer Diagnoses

Miranda Rector

Vanderbilt University

Parental Syntactic Complexity and Children's Observed Behavior in Communication about Children's Recent Cancer Diagnoses

According to the National Institute of Cancer (2005), approximately 12,400 children are diagnosed with some form of cancer in the United States each year. One of the most difficult tasks facing the parents of these children is the question of how they should appropriately communicate with their child about cancer and the child's future in terms of treatment, surgeries, and prognosis. The child's understanding of cancer related terms as communicated by parents, doctors, and medical staff as well as the parent's nature of communication before and during treatment affects the level of the child's worry and stress through this difficult time period (Blount *et al.*, 1989, 1990, 1991; Chapman, Jenkins, & Fallowfield, 2003). Furthermore, in order for the child to more easily comprehend the nature of his/ her health, the parent should take the child's level of syntactic development into consideration and adjust his/her speech accordingly when communicating about cancer and related issues (Nippold, Hesketh, Duthie, & Mansfield, 2005).

Communication and Distress Research

Previous research suggests that the terms used in communication to children and how well they are comprehended by the patient (Blount *et al.*, 1989, 1990, 1991) as well as parent communication style used in discussing treatment procedures with the child contribute to worry and distress levels in children with cancer after diagnosis and treatment (Chapman, Jenkins, & Fallowfield, 2003).

In a sample of adults Chan and Woodruff (1997) found that 10% of individuals who had cancer were unaware of their cancer diagnosis completely while 22% were unclear or somewhat unclear about the nature of their cancer diagnosis. Some researchers believe that the unclarity

and misunderstanding of the diagnosis leads to poor patient decision making in terms of treatment, decreased quality of life, and lower patient satisfaction with medical care (Weeks *et al.*, 1998). Despite popular belief that many cancer patients are in denial of their condition and wish to remain uninformed of their illness, Meredith *et al.* (1996) found that 79% of patients want to be as informed as possible about their illness and almost all patients (96%) would like to know upfront that they do in fact have cancer. In informing these patients, studies show that euphemisms used for cancer and technical medical jargon only take away from patient's understanding and peace of mind rather than helping them understand their diagnosis (Fallowfield, 1997).

A study conducted by Chapman, Jenkins, and Fallowfield (2003) explored the lay person's understanding of cancer related terms based on age, occupation, gender, and experience with cancer and their levels of comprehension's affect on their associated state of worry. It was found that women (regardless of age) had a better overall understanding of cancer related terms and that age, occupation, and previous experience with cancer had no significant effect on the person's ability to comprehend cancer related terms. Persons who had a higher comprehension of terms in general had more appropriate levels of worry depending on whether the patient was receiving good news or bad news (e.g. higher worry when understood that the cancer had "metastasized" and lower levels of worry when told the cancer was "benign").

A study by Cline, Harper, Penner, and Peterson (2006) discusses the effect of parent communication prior to treatment procedures on patient distress after treatment. Parent communication, according to Cline, Harper, Penner, and Peterson (2006), follows a symbolic interaction theory where a child's behavior is and coping is guided by the parent's concurrent behavior (e.g., demonstrated coping behaviors and identification of roles played by doctors and

patients). Reduced distress was shown in patients 5-13 years of age when parent encouraged coping strategies, displays distraction, and offered clear explanations of the procedure (Blount *et al.*, 1989, 1990, 1991). Greater patient distress was exhibited in situations where parent communication displayed threat, punishment, or overly empathetic behavior (e.g., overly apologetic or criticizing comments) (Dolgin & Katz, 1988). The same distressing effect was seen when parents yielded control to the child and the child was in complete domination of the interaction without discipline (Blount *et al.*, 1989, 1990, 1991).

Syntactic Development Research

A limited amount of syntactic development research has been done in the area of traumatic events in normally developing children. Furthermore, development research and not research addressing communication at syntactically appropriate levels dominates the field. Syntax is a fundamental element of the acquisition and execution of oral language. By definition, syntax is the way of combining separate units of meaning in order to form spoken utterances. The most important period for syntactic development is from birth to eight years old and most measures of appropriate development only explore levels of syntactic achievement between these ages up to nine years old. Little research has been conducted concerning the ongoing development of language in children after 9 years old and through adolescence. Because of the lack of normative tests and measures in order to track ongoing syntactic progress, language development studies are important in developing a standard line of language acquisition and advancement to provide points of comparison among normal language development and that of a disabled child (Simms & Crump, 1983).

Language development deviations from the norm are a crucial indicator of disability in a child or some other developmental problem that may hinder the child's normal functioning.

Researchers have observed that disabled children produce grammatically incorrect sentences, fail to use many syntactic structures, have a limited vocabulary, and often use “filler” words instead of more complex and specific wording (Andolina, 1980). Thus, it may be important to study the syntax of children with cancer as an indicator of problems they may be experiencing with coping and communication about their illness.

Within other development research concerning the acquisition of syntax, Gleitman, Newport, and Gleitman (1984) found that the overall syntactic complexity of a mother’s utterances is positively correlated with a child’s syntactic growth. Some theories surrounding the development of syntax state that more exposure to speech should lead to more rapid language acquisition and that heredity and amount of language input by the parent will lead to more rapid syntactic acquisition. In regards to the traumatic event of child maltreatment, it was found that mothers who maltreat their children are more unresponsive and controlling than mothers who do not which may have an impact on the way they communicate with their children and consequently affect their children’s acquisition and comprehension of language (Crittenden, 1981, 1988).

Eigsti and Cicchetti (2004) researched the utterances of maltreating mothers and non-maltreating mothers in structured interactions that were coded for the types of language the mothers used when speaking to their children. They found that maltreating mothers used less complex utterances and yes/no questions in the interactions than the non-maltreating group and were less likely to respond to their child’s utterances appropriately and immediately. Maltreating mothers were also less likely to use auxiliary verb grammatical forms than non-maltreating mothers. Since their mothers are not able to communicate at an appropriate level to them, maltreated children’s language acquisition is delayed in forming syntactic complexity and

extended vocabulary. This is more likely to effect girls than boys according to Eigsti and Cicchetti (2004). This implies that it is important for children to be exposed to syntactically appropriate communication in order to expand in knowledge and language development.

Limitations in Prior Research

The research reviewed discusses communication in terms of specific factors faced by cancer patients: understanding of terms and communication about treatment procedures. No known research has discussed specifically one of the main questions faced by parents when a child is diagnosed with cancer: What do I tell my child about his/her health condition and what is the best manner in which to discuss this subject? Communication immediately followed by diagnosis is one of the most difficult times for a parent to approach the child about his/ her illness and research needs to be done addressing parents' questions of how they should address the topic in a manner that is best for the child's quality of life and coping.

In regards to the study of syntactic complexity and development, most studies address the syntactic development of disabled children and their parents' ability to speak at a level that is appropriate for their developmentally disabled child to understand. No known studies focus on normally developing children who are faced with traumatic situations excluding studies of the effect of maltreatment and abuse on children's syntactic development (Eigsti & Cicchetti, 2004). No studies combine specifically traumatic situations like cancer diagnosis with the ability of the parent to communicate on a level that is syntactically aligned with the child's own syntactic level based on age.

The Current Study

The current study addresses the relationship between the parent's ability to speak about cancer related issues in a syntactically appropriate level for the child's age on the child's distress

and coping as seen in the child's exhibited behaviors of anxiety, positive mood, and hostility. According to previous research, parent's syntactic output should be more complex when speaking to older children and adolescents than with small children. If a parent's syntactic level is too complex for the child's developmental level, the child may exhibit increased anxiety in an interaction. Contrastingly, if the syntactic level is exceedingly lower than that of the child's and overly simplified, this may lead to frustration in the child as a result of too little information being conveyed to the child and more hostility and externalized negativity observed in the interaction. If the syntactic levels of the parent and the child's developmental level are aligned, however, the child may exhibit less anxiety, hostility, and externalized negativity and more positive mood.

Method

Participants

Subjects were primary caregivers and their children 5 to 17 years of age who have received a primary diagnosis of cancer including acute lymphocytic or nonlymphocytic leukemia, lymphoma, central nervous system tumor, neuroblastoma, soft tissue sarcoma, bone cancer, or other solid tumors. The child must have no prior history of disease (e.g., chronic disease lasting longer than 6 months which require pediatric sub specialist treatment) with a new diagnosis of cancer or a recurrence of a previous cancer diagnosis that has been in remission. The child also may not have a pre-existing neurodevelopmental disorder or disability. These participants were recruited on a voluntary basis through the Division of Hematology/Oncology from two sites; Vanderbilt University Children's Hospital and Nationwide Children's Hospital/Ohio State University. Participants were all English speaking.

Subjects were participants from the second observational phase of the larger study who have consented and completed the video observation portion (phase II) of the research project three months after the initial phase of recruitment and completion of a questionnaire battery. The families were compensated \$50 for their participation.

A total of 15 parent/child pairs were sampled for this study ($N = 15$). The mean age of the children participating was 11.47 years of age with a minimum age of 6 years and maximum age of 17. An almost equal representation of male versus female children participated with 8 boys and 7 girls. Fourteen of the primary caregivers were female whereas only 1 of the primary caregivers was male.

Procedure

Eligible families met with a trained research assistant and were guided through a consent procedure which included the research assistant meeting with the family in the hospital at their discretion and explaining each questionnaire in detail with the child and primary caregiver. The families were then given the option of either completing the questionnaires at that time in the presence of the research assistant or taking the questionnaire with them and returning it to the research assistant at a later date. Research assistants were especially sure to give assistance to those children or primary caregivers who were unable to read or fully understand all that the questionnaire battery was asking of them. All families gave informed consent to participate in questionnaires and videotaped interactions according to the Internal Review Board.

All questionnaires were completed 3 months prior to phase II of the study that consisted of completing 15 minute videotaped interactions between the child and the primary caregiver. This 15 minute time specification was chosen according to the design of the coding system utilized (Melby & Conger, 2001). The parent and child were instructed to talk for 15 minutes

guided by a set of prompts designed to illicit conversation conducive to providing evidence of ways in which the parent and child communicate about the child's cancer and the way they are coping with the diagnosis. The following questions were used as guidelines for the interactions; parents and children were instructed to talk for the entire 15 minutes and not restricted to discussion of only the topics of the questions:

- 1.) When and where have we talked about your illness?
- 2.) What kinds of things have we already talked about regarding your illness?
- 3.) How does it go when we talk about your illness? What has made it easier to talk about?
What has made it harder to talk about?
- 4.) What do we think might happen next?

Cards were given to the parent and child with these questions written on them. Either the parent or child was able to lead the interaction by holding the cards and addressing the questions on the cards. After completing the instructions, the research assistant turned on the camera and left the room. When the 15 minutes had passed, the research assistant ended the conversation by knocking on the door. The interaction was followed by a short debriefing session. The dyad interactions were later transcribed into exact scripts by a team of trained research assistants in order to analyze them according to linguistic complexity.

Measures

Observed Behaviors. The Iowa Family Interaction Rating Scale (IFIRS) was used to code observed emotional and behavioral aspects of the individual and dyad in the interaction. This scale is designed to quantify the behavior within the interactions according to context and quality. By using a scale of "1-9", the IFIRS system rates the "characteristic ness" (1 being "not at all characteristic" and 9 being "mainly characteristic"). This scale takes frequency of

behaviors, context and affect, and intensity and proportion into consideration in order to rate the individual. The individual characteristics coded were anxiety, positive mood, hostility, and externalized negative. These codes were selected in order to capture both the positive and negative emotional and behavioral responses exhibited by the child as a result of the linguistic patterns exhibited by the primary caregiver in his/her conversational speech to the child.

The IFIRS coding system uses a set of guidelines designed to improve reliability and validity in assessing observed behavior. Each tape was coded a total of 5 times; once for initial reactions, and twice for each individual being assessed (primary caregiver and child). The focal to be coded first was chosen at random and each interaction was double coded (by two researchers specially trained and proven reliable in the IFIRS coding system) to ensure inter-rater reliability. The coders were not aware of any details of either the parent or the child with regard to demographic information or cancer diagnosis. Coders met to discuss and reconcile any scores that were more than two rating scores apart on the 9 point scale. When inter-rater reliability was below 60%, the tape was recoded by the research assistants, and the coders reconvened to reconcile any scores that remained more than two rating scores apart.

Child Behavior Checklist (CBCL). The Child Behavior Checklist was included within a battery of questionnaires that parent was asked to complete in phase I of the study. This questionnaire asks the parents to rate their child in matters of behavior and social competencies such as the amount of anxiety the child is experiencing or how aggressive the child is. The CBCL consists of 118 items related to behavior problems and 20 questions about social competency which ask the parent to rate their child on their involvement in such areas as sports, hobbies, organizations, jobs, and other activities. These items are rated on a 3 point scale ranging from not true to often true of the child. For the current study, responses on the CBCL of

anxiety/depression and aggression of the child were utilized as a behavioral measure of anxiety and hostility.

Syntactic Complexity. The current study utilized one measure for syntactic complexity; counts of grammatical construction (specifically wh- questions including “how” questions). Wh- questions served as an indicator of complexity of syntax where the parent’s use of a greater number of wh- questions designated a more complex syntax and vice versa. Tapes of observed interactions from the behavioral study were transcribed by researchers at Ohio State University using a specific process. The number of wh- questions was counted in the parent’s utterances to determine the complexity of communication between the child and the parent and the potential for open conversation at a developmentally appropriate level within the dyad. The child’s wh- questions were also tallied in order to make any comparisons between the number of questions used by the child and the number observed of the parent.

A simple process was used to tally the number of questions from each subject. A wh- question was considered any question uttered beginning with who, what, when, where, why, and how since these utterances present an open response possibility for the person being spoken to rather than the more simple categorical question that may lead to a yes/no response. Those questions uttered that exactly quoted the cue card conversation guides were not included within the counts. In each transcript, the wh-question indicator word was boxed by the rater and then separate counts were done for both mother and child. Each subject’s question utterances were counted twice, once counted from the beginning of the transcript and the other time counted from the back to the front in order to maintain an agreed upon and accurate count.

Results

The mean number of wh- questions uttered by the child was 2.60 with a standard deviation of 2.38. The mean number of wh-questions spoken by the primary caregiver during the interaction was 13.20 with a standard deviation of 9.14 (see Table 1). Thus, parents asked considerably more questions during the interaction than did their children.

Correlations between Child's Age and Wh-Questions Uttered. Preliminary analysis revealed no significant correlations between the child's age at the time of the study and the number of wh- questions uttered by the parent in the interaction. Correlations between the child's age at the time of the study and the number of wh-questions spoken by the child were also not significant. The initial hypothesis of child's age as a predictor of the nature of the parent's syntactic patterns was not supported.

Correlations between Child's Age and Wh- Questions with Observed Behaviors and CBCL. Correlation analysis of child's age with mother's wh- questions revealed a significant correlation between mother's number of wh- questions with parent's report of child's anxiety on the CBCL ($r = .54, p < .05$) (see Table 2). No significant correlations between the child's age and observed anxiety, externalized negative, or CBCL report of aggression were found as previously hypothesized. This leaves a question of a causal effect; is it the child's anxiety that motivates the parent to ask more questions or does asking more questions lead to an increase anxiety in the child?

Regression Predicting Child's CBCL Anxiety from Mother's Amount of Wh-Questions and Child's Age. One test of multiple regression analysis was conducted to test the mother's amount of wh- question and the child's age as a predictor of the child's anxiety as reported by the CBCL. Neither the child's age nor the mother's amount of wh- questions uttered proved to be a significant predictor of CBCL anxiety. (see Table 3)

Discussion

The current study revealed that child's age is not a significant predictor of the amount of wh- questions the primary caregiver asks or an indicator of the syntactic complexity pattern of the parent. It was found that the subjects within this study did not modify the pattern of their speech based on the age of their child and no significant effects on observed anxiety, externalized negative, or CBCL aggression were witnessed. The unexpected finding of significant correlation between CBCL reported anxiety and mother's amount of wh- questions has great implications for future research.

Some limitations to the current study exist. In the sample analyzed, no Spanish speaking families were enrolled, therefore, a cross cultural component of study was missing from the data. Also, only two sites for recruitment were available and this factor may limit the sample based on the types of families that consented. Similarly, there may have been a bias towards which families are more likely to consent to participate in such a study (i.e. more openly communicating families may be more likely to consent to participation than families that are having difficulties communicating). This may have caused the data to be less of a representation of all families in the proposed population.

Another weak area in the current study is the small sample size (N=15) and greatly underpowered. There also exists a lack of fathers as primary caregivers within the subjects. If a larger sample is drawn in future research, a more significant effect may be observed. Additionally, a more equal representation of both mothers and fathers as primary caregivers may yield an increased ability to compare the syntactic styles of mothers to fathers in the observation phase.

Specifically, the syntactic analysis may need to be more in depth and precise in future studies. Since this study is part of a larger, more complex study of communication and coping, future syntactic measures will include an in depth observation of pauses, lengths of utterances, yes/no questions, and interruption within utterances that may reflect a better understanding of the best language and communication a parent can use in order to guide his/her child through his/her illness and better cope with the stress of Cancer. It may be important to evaluate syntactic differences and the resulting displayed behaviors as a function of gender as well. Girls' verbal communication and emotional states in situations may differ greatly from that of boys so this may be an interesting area upon which to reflect and evaluate whether or not different communication styles/syntactic levels should be adopted based upon the gender of the child.

The current study offers implications for the future on the causal relationship between mother's wh-questions and the child anxiety. There was a significant correlation between the amount of wh-questions the primary caregiver offers and the child rating of anxiety on the CBCL. Future studies should replicate this study with a larger sample and explore whether it is the mother's increased amount of wh- questions asked that causes an increase in child anxiety or if the amount of wh- questions the mother asks is a function of how anxious the child seems at the time of the interaction.

References

- Andolina, C. (1980). Syntactic maturity and vocabulary richness of learning disabled children. *Journal of Learning Disabilities*, 13: 372-377.
- Blount, R.L., Corbin, S.M., Sturges, J.W., Wolfe, V.V., Prater, J.M., & James, L.D. (1989). The relationships between adults' behavior and child coping and distress during BMA/LP procedures: a sequential analysis. *Behavior Therapy* 20: 581-601.
- Blount, R.L., Landolf-Fritsche, B., Powers, S.W., & Sturges, J.W. (1991). Differences between high and low coping children and between parent and staff behaviors during painful medical procedures. *Journal of Pediatric Psychology* 16: 795-809.
- Blount, R.L., Sturges, J.W., & Powers, S.W. (1990). Analysis of child and adult behavioral variations by phase of medical procedure. *Behavior Therapy* 21: 33-48.
- Chan, A., Woodruff, R.K. (1997). Communicating with patients with advanced cancers. *Journal of Palliative Care* 13: 29-33.
- Chapman, K., Abraham, C., Jenkins, V., & Fallowfield, L. (2003). Lay understanding of terms used in cancer consultations. *Psycho-oncology* 12: 557-566.
- Cline, R.J.W, Harper, F.W.K., Penner, L.A., & Peterson, A.M. (2006). Parent communication and child pain distress during painful pediatric cancer treatments. *Social Science & Medicine* 63: 883-898.
- Crittenden, P.M. (1981). Abusing, neglecting, problematic, and adequate dyads: differentiating by patterns of interaction. *Merrill-Palmer Quarterly* 27: 201-208.
- Crittenden, P.M. (1988). Relationships at risk. In J. Belsky & T. Nezwarski (Eds.), *Clinical Implications of Attachment* (pp. 136-174). Hillsdale, NJ: Erlbaum.

- Dolgin, M.J., & Katz, E.R. (1988). Conditioned aversions in pediatric cancer patients receiving chemotherapy. *Journal of Developmental and Behavioral Pediatrics* 9: 82-85.
- Eigsti, M., & Cicchetti, C. (2004). The impact of child maltreatment on expressive syntax at 60 months. *Developmental Science* 7: 88-102.
- Fallowsfield, L. (1997). Truth sometimes hurts but deceit hurts more. *Annals Y Acad Sci* 809: 525-536.
- Gleitman, L.R., Newport, E.L., & Gleitman, H. (1984). The current status of the motherese hypothesis. *Journal of Child Language* 11: 43-79.
- Hatch, R.L., Burg, M.A., Naberhaus, D.S., & Hellmich, L.K. (1998). The Spiritual Involvement and Beliefs Scale. *Journal of Family Practice*, 46, 476-486.
- Melby, J. N., & Conger, R. D. (2001). The Iowa Family Interaction Rating Scales: Instrument Summary. In P. Kerig and K. Lindahl (Eds.), *Family observational coding systems: Resources for systemic research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Meredith, C., Symonds, P., Webster, L. *et al.* (1996). Information needs of cancer patients in west Scotland: cross-sectional survey of patients' views. *Br Med J* 313: 724-726.
- Nakao, K., & Treas, J. (1992). The 1989 Socioeconomic Index of Occupations; Construction from the 1989 Occupational Prestige Scores (General Social Survey Methodological Report No 74). Chicago: University of Chicago, National Opinion Research Center.
- Nippold, M.A., Hesketh, L.J., Duthie, J.K., Mansfield, T.C. (2005). Conversational versus expository discourse: a study of syntactic development in children, adolescents, and adults. *Journal of Speech, Language, and Hearing Research* 48: 1048-1064.
- Simms, R.B., Crump, W.D. (1983). Syntactic development in the oral language of learning

disabled and normal students at the intermediate and secondary level. *Learning Disability Quarterly* 6: 155-165.

Weeks, J.C. Cook, E.F., O'Day, S.J. *et al.* (1998). Relationship between cancer predictions of prognosis and their treatment preferences. *J An Med Assoc* 279: 1709-1714.

Table 1
Descriptive Data

	mean	standard deviation	N
Child's Age	11.47	3.25	15
Mother's Wh-Questions	13.20	9.14	15
Cbcl anxiety	2.64	1.98	14
Cbcl aggression	3.21	2.94	14
Observed anxiety	5.29	1.80	7
Observed externalized negative	3.29	1.11	7

Table 2

Correlations Between Child's Age, Mother's/Child's Wh-Questions with Observed

Behaviors and Child Behavior Checklist Anxiety and Aggression

	1.	2.	3.	4.	5.	6.	7.
1. Child's Age	--						
2. Mother's Wh-Questions	-.19	--					
3. cbcl anxiety	-.29	.54*	--				
4. cbcl aggression	.08	.18	.20	--			
5. observed anxiety	.15	.42	.04	-	--		
6. Observed externalized negative	-.26	.63	-.07	-	-.21	--	

Note: * $p < .05$

Table 3

Regression Equation Predicting Child's CBCL Anxiety from Mother's Amount of Wh-Questions and Child's Age

Equation 1 – CBCL Anxiety		Final R2 = .34	$F(3,10) = 1.7, p = .22$
Step 1: R2 change = .14	β		
Child's Age	-.21		
Mother's Wh-Questions	.50		

Note: β = standardized coefficient