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Analysing narrative productions in older school-age children and adolescents with fetal alcohol syndrome: an experimental tool for clinical applications

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Abstract

The most devastating teratogenic effect of alcohol on the unborn child is fetal alcohol syndrome (FAS). FAS is a permanent birth defect that results in lifelong disruptions in cognitive, linguistic and social development. One of the most debilitating effects of prenatal alcohol exposure involves the development and use of social communication. Deficits in social communication jeopardize academic success and appear to play a major role in the maladaptive and dysfunctional behaviours present in older school-age children and adolescents with FAS. The ability to manage longer units of social discourse is a defining feature of adolescent language. Narratives are extended texts that occur frequently in the language of the classroom and in a variety of meaningful social contexts. The demands of narratives provide clinicians with a window of opportunity from which to examine the social—communicative processes of youngsters with FAS. In this paper we introduce an experimental protocol that has been designed to sample narrative discourse using a wordless picture book as the eliciting stimulus. Spoken narratives are scored for their cohesion (i.e. linking related events into logical networks) and coherence (i.e. informativeness). The clinical utility of the protocol is demonstrated and discussed, with a case presentation of two adolescents with FAS and a sample of typically developing peers.

Keywords: narratives, adolescents, school-age children, assessment, fetal alcohol syndrome.

Introduction

A generation has passed since fetal alcohol syndrome (FAS) was first identified as a birth defect. Curiously, relatively little reliable information has accumulated over the past *25* years regarding the communicative abilities of this clinical population, despite the fact that virtually every parent, experienced professional and/or knowledgeable researcher has commented on their 'unusual' social—communicative skills. Arguably, the most debilitating social—communicative behaviours associated with FAS manifest near the time youngsters are reaching adolescence. Since one of the most important advances in adolescent language is the ability

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to manage longer units of discourse, we have developed a tool that examines narrative productions in older students. The purpose of this paper is to introduce the experimental tool and present preliminary data regarding its potential effectiveness in assessing the oral narratives of school-aged children and adolescents with FAS.

Significance of the problem

Alcohol teratogenesis

Alcohol is a neurobehavioural teratogen capable of causing birth defects, central nervous dysfunction and mental retardation (Carmichael-Olsen, Streissguth, Bookstein, Barr and Sampson, 1994). The most devastating teratogenic effect of alcohol on the unborn child is fetal alcohol syndrome (FAS). FAS is a permanent birth defect syndrome caused by maternal consumption of alcohol during pregnancy. The syndrome is remarkable for a cluster of distinctive birth defects that include: (a) a specific facial appearance; (b) growth deficiency for genetic background; and (c) organic brain damage (see Jones and Smith, 1973; Astley and Clarren, 1996). Children born with FAS are far more prevalent than babies with chromosome disorders, with metabolic/exocrine disorders or with specific neurological disorders (Plumridge, Bennett, Dinno and Branson, 1993).

FAS disrupts the development and use of social communication. The social-communicative functions of language allow people to exchange information, initiate and develop social relationships, cope with changing environmental demands and assert one's needs, desires and preferences (Walker, Schwarz, Nippold, Irvin and Noell, 1994). In short, social communication enables people to influence 'day-today' events in their lives. Deficits in social communication, therefore, jeopardize school, home and personal interactions, and may play a major role in the maladaptive and dysfunctional behaviours associated with FAS (Burgess and Streissguth, 1992). Table 1 summarizes a set of behavioural deficits reported by the parents of FAS youth that compromise their social—

Table 1. *Behavioural deficits observed by parents of school-age children and adolescents with fetal alcohol syndrome that impairs social communication*

Impulsive Acts hastily or on sudden impulse without evidence of forethought.
Concrete thinkers and problem-solvers Decisions are based on intuitive judgements rather than conscious attention or critical thinking.
Lacks understanding of cause-effect Repeats the same misguided action regardless of consequences. Gives little evidence of learning from experience, regardless of structure.
Limited organizational skills Exhibits genuine difficulty in being able to plan and execute a series of goal-related actions.
Verbal but not communicative Shows a tendency towards high verbal output (i.e. verbosity). Often interjects comments based on personal experience that are either unrelated or remotely related to the topic at hand.
Poor social skills Demonstrates little desire to please socially significant people; limited social attachment; exercises poor social judgement.

communicative interactions (Coggins, Clarren and Astley, 1996). The magnitude of these deficits places adolescents with FAS at high risk for antisocial behaviours, academic failure, personal injury, incarceration and/or a welfare-state existence (Larson and McKinley, 1995).

Effects of FAS on language and social communication

Little empirical evidence is available on the language and social communication of alcohol-affected youngsters and adolescents. Most of what we know is based on anecdotal observations or case studies by investigators whose primary concern has been in the areas of intellectual functioning, academic achievement and/or adaptive behaviour. Despite the dearth of experimental data, a diverse set of individuals consisting of parents, practitioners and professionals has described a similar set of communicative characteristics in this clinical population.

School-age children with FAS are often perceived to have strong verbal abilities, particularly in the expressive language domain (Abkarian, 1992; Kleinfeld and Wescott, 1993). For example, language form (i.e. syntax, morphology and phonology) and language content (e.g. word knowledge, world knowledge) have been reported to be within the normal range of performance on standardized assessment (see Abkarian, 1992). With reference to adolescents and adults with FAS, Streissguth, Aase, Clarren, Randels, LaDue and Smith (1991) have used the terms 'comfortable', 'chatty' and, at times, even 'loquacious' to capture the friendly, informal and talkative nature of their subjects. The mental dictionaries of youngsters with FAS can also contain a surprisingly robust vocabulary. As part of a comprehensive psychoeducational assessment, Clarren, Clarren, Astley, Shurtleff, Unis and Weinberger (1994) used the Peabody Picture Vocabulary Test—Revised (PPVT-R) (Dunn and Dunn, 1981) and Expressive One- Word Picture Vocabulary Test (EOWPVT) (Gardner, 1990), to assess the lexical knowledge of 14 male subjects diagnosed with FAS. The subjects ranged in age from 9;0 to 14;0 years. The researchers found that receptive and expressive language, as measured by these vocabulary tests, was the highest area of functioning for their subjects across all psychoeducational measures. The subjects' mean expressive vocabulary score was 93.9 (standard deviation = 16.8) which placed them as a group in the average range of performance. The subjects' mean receptive vocabulary score was 83.1 (standard deviation = 11.2), placing them in the low average range. Expressive vocabulary scores were found to be significantly higher than receptive.

Having lots of words does not, however, necessarily mean that one can use those words to make friends or find solutions to socially important tasks or issues. Clarren and colleagues (1994) noted that when their subjects were confronted with social situations that required them to say and understand more than one word at a time, 'the boys could not [emphasis added] perform appropriately' (p.13), suggesting a gap between their linguistic abilities and their social use of those abilities.

A discrepancy between measured linguistic abilities and social use of language resonates well with behavioural descriptions of youngsters with FAS. Burgess and Streissguth (1992) reported an overall discrepancy between the verbal behaviours associated with FAS and the ability of young people with this deficit to use their language 'to live and participate in social environments' (p. 26). Their social— communicative deficits seem to reflect a meagre understanding of the intentions and/or interpretations that underlie successful interpersonal interactions (Astington, 1994).

Dysfunctional communicative behaviours do not abate with age (Guinta and Streissguth, 1988), Streissguth et al. (1991), for example, found that not one of their 61 adolescent or adult subjects had age-appropriate socialization or communication abilities despite their easy-going, talkative demeanour. Clinical assessment of young adults with FAS has revealed that they fail to develop the needed social—communicative competence to interpret (i.e. make sense of) the actions of other people (Coggins, 1997).

While we currently lack a satisfying experimental database, there

is an overwhelming sense that individuals with FAS present a distinctive communicative profile:

1. Communicative abilities appear discontinuous with those of chronological age (CA)-matched, typically developing youngsters and mental age (MA)-matched, mentally retarded peers, without a history of prenatal alcohol exposure (Abkarian, 1992; Coggins et al., 1996).
2. Social—communicative competence is remarkably lower than would be predicted from formal language testing.
3. Presumed linguistic competence is not used in the service of logical judgements, critical thinking and social problem-solving.

Assessing social communication

Any serious attempt to understand the constellation of behaviours associated with FAS must wrestle with the following conundrum: *Why do individuals judged 'highly verbal' have so much trouble using language for purposes of social communication?* We believe that the communicative demands presented in narrative productions provide unique opportunities for unravelling this connected discourse puzzle. Since narratives require the ability to make sense of the world through inferencing and perspective taking, these structured events allow us to explore more fully the social-communicative processes of youngsters with FAS.

The value of narratives

Because the ability to manage longer units of discourse is one of the defining features of adolescent language (Nelson, 1993), young people who are able to deal with extended units of text have access to multiple pieces of relevant information with which to perform higher-level reasoning, critical thinking and problem solving. Narratives are extended texts that occur frequently in the language of the classroom, and in a variety of meaningful social contexts. They provide a means of verbally recapitulating past experiences, allow individuals to make sense of events in their lives, and have been found to be strong predictors of future academic success (Feagans and Appelbaum, 1986; Bishop and Edmundson, 1987).

Narratives have been compared to bridges. Architecturally, bridges serve as physical structures that provide pedestrians or vehicles with a means to cross over a barrier. Musically, bridges connect passages between two sections of a composition. Linguistically, narratives function as psychological bridges between oral communication, which functions to regulate social interactions, and literate written language, which functions to regulate thinking (Westby, 1984).

As school-age children reach adolescence, the ability to comprehend and produce narratives becomes crucial for school success, as well as for peer acceptance (Paul, 1995). With respect to the former, researchers have argued that narrative skills are inextricably bound with the development of reading and writing. Data are also accumulating to support the position that spoken and written narratives mutually influence the development of each other (see Larson and McKinley, 1995; Paul, 1995). With reference to peer acceptance, narratives serve as an important source of knowledge about social cues, the mental (i.e. internal) states of other people and the value of conforming to moral standards.

Assessment protocol

There are many types of narratives that can be told, and many contexts and reasons for telling them (Hogan and Strong, 1994). Given the prominent role narratives play in the lives of adolescents, it is surprising to find few standardized narrative assessments. Those who seek to analyse narrative productions must design and structure tasks to meet the needs

and characteristics of the population they wish to study (e.g. Liles, 1985, 1987; McCabe and Rollins, 1994; Paul, 1995) in order to provide information of value (Korchin and Schuldberg, 1981).

The experimental protocol summarized here was designed to elicit a narrative discourse that shared a middle ground (Paul, 1995) between conversational language and literate language. Our intent was to sample a spontaneously produced monologue that regulated a social interaction and shared information (i.e. conversational language) but was centred around a preselected topic where meaning was derived from inferences and conclusions drawn from a specific text (i.e. literate language).

The narrative

The protocol was conceived as a criterion-reference measure of performance. Thus, the eliciting task (i.e. the narrative content) was held constant across subjects in order to determine if youngsters with FAS had achieved certain levels of performance. The eliciting stimulus was Mercer Mayer's (1969) book *Frog, Where are You?* The book is an adventure story about a boy and his dog who search for a lost frog. What sets this 'runaway' frog story apart from most fictitious narratives is the fact it is a *wordless* picture book. With the exception of the title page there are absolutely no words in *Frog, Where are You?* The *Frog* story consists of 24 pictures.

An experienced clinician presented each subject with *Frog, Where are You?* and encouraged the youngster to look through the book in order to become familiar with the general story line. When the youngster completed previewing the story, the clinician returned the book to the opening page and exhorted the child to tell the best story possible. Youngsters were allowed to page through the book a second time as they created their narratives using story pictures as visual guideposts. The spoken narrative was recorded on audiotape for later transcription and scoring.

Because subjects were allowed to tell stories from their own perspective, one might have expected considerable variability in narrative productions. However, every adolescent we have recorded in our pilot work (both typically developing and FAS) has related the same basic story line from loss of the frog, through a series of searches to recovery. Thus, like Berman and Slobin (1994), we believe that Frog, Where are You? provides professionals with an unparalleled opportunity to gain a deeper appreciation of the 'complex linguistic, cognitive and communicative abilities that underlie the human ability to capture and convey events in words' (p. ix).

The narrative elicitation protocol is a clinical tool. The primary objective in developing the tool was to create an instrument that experienced clinicians could employ to gather useful information about atypical children in a relatively brief amount of time. Clinical assessment typically involves a relationship between two people the client and the clinician. Thus, to preserve the developing bond between client-clinician and maintain clinical utility of the protocol, we opted to have the clients share their stories with the clinician. To be sure, the clinician could not be considered a totally naive listener and, as such, might conceivably influence the client's story. However, listener familiarity is more likely to influence the structural characteristic of a story (e.g. greater use of embedded clauses) than social—communicative functions. Furthermore, since the largest gains in social perspective-taking and subsequent tailoring of individualized messages occurs between the ages of 7 and 9 years (Owens, 1996), we were not particularly concerned that an experienced clinician would unduly influence outcome.

Scoring criteria

Based on our clinical experience, the ability to relate a satisfying narrative requires control of two complementary components: cohesion and coherence. With respect to cohesion, we were interested in knowing whether youngsters were able to link a series of related events into logical networks or episodes (Paul and Smith, 1993). To produce a series of utterances that 'hang together', the narrator must be able to interpret and integrate event context (Lund and Duchan, 1993). According to Trabasso

and Rodkin (1994), what is narrated depends to a large extent on being able to understand cause—effect, to be aware of logical connections and, perhaps most importantly, to interpret the mental states of story characters (Sargent and Coggins, in preparation).

Being coherent means being informative. To be informative, one must use precise vocabulary, talk about essential story elements and leave no doubt in the listener's mind as to what is intended. Thus, a satisfying narrative is one in which the narrator does not presuppose unwarranted knowledge on the part of the listener. This can be a particularly challenging endeavour, since the narrator must continuously revise his/her utterances with respect to the knowledge that a listener has acquired during the narrative about the topic.

Story cohesion. The *Frog* story is built around a plot structure (Trabasso and Rodkin, 1994). A plot is a hypothetical scheme for organizing a story that consists of an initiating event and a series of episodes (Stein and Glenn, 1979). The initiating event (IE) sets the stage for the remainder of the story. In other words, the IE causes the main character(s) to formulate goal-directed behaviours in an effort to achieve a desired end, resolve a dilemma or evaluate an outcome. The IE in the Frog story occurs when a pet frog escapes one night through an open bedroom window while a little boy and his dog are sleeping. A subject must explicitly state that the *frog escapes while the boy and his dog are sleeping*, to receive credit for the IE.

The remainder of the *Frog* story is a series of episodes or 'subplots' that propel the characters through a series of searches to locate the missing frog. To our way of thinking, the *Frog* story consists of five highly structured, logically related episodes. Each episode is composed of three hierarchical components: a *goal* (desire or intention of characters), *attempts* (overt actions to satisfy or obtain goals) and an *outcome* (attainment or non-attainment of goal). For a subject to be given 'credit' for a story episode, all three components must be included. To illustrate, the fifth episode is the boy's final search for his missing frog. The episode unfolds over six story pictures during which the subject must tell the examiner: (a) the goal of this event (i.e. to find the missing frog near a pond), (b) what attempt(s) the main character(s) have made to achieve the goal (i.e. the boy and dog look behind a log), and (c) the outcome (i.e. the boy finds many frogs and leaves with a baby frog). Table 2 presents the utterances spoken by a typically developing 14-year-old adolescent for the fifth story episode. This example reveals how the youngster used his language to explicitly code the goal, attempt and outcome of the episode. Utterances that code essential features of each component are italicized. Table 3 presents the complete episodic model we have created to examine story cohesion for *Frog, Where are You*?

Story coherence. The second story component in our protocol, coherence, addresses the 'informativeness' of the narratives. As we began developing operational definitions, we were confronted with a non-trivial challenge--trying to distinguish between subjects who simply 'sounded' informative (i.e. coherent) from those who were clearly expressing the essential elements of the story pictures. Communicating unambiguous information to a listener often means going beyond listing the contents of each picture, beyond commenting on the obvious and beyond stative description of

Table 2. *Narrative discourse from a typically developing 14;4-year-old adolescent illustrating the three component parts (Goal, Attempt and Outcome) required to receive credit for Episode 5 of* Frog, Where are You?

Episode 5: Searching Near a Pond for the Missing Frog (picture plates 19—24)	
Picture 19	
And they sit up in the water.	(+ Goal)
And the boy hears something.	
He thinks it might be his missing frog.	(+ Goal)
Picture 20	
He goes to the log where he thinks that the sound is coming from. He tells the dog to be quiet.	
Picture 21	
Then, they peek over the log.	(+ Attempt)
Picture 22	
And they see the frog and another frog.	
He knows that the bigger frog is his frog that escaped.	
Picture 23	
And little frogs come out of the bushes.	(+ Outcome)
And they hop on over to the boy.	
He decides not to step in because he might step on a frog.	
Picture 24	
Well, he picks up a little baby frog and walks off.	
His dog is happy to see the little baby frog.	
He's happy because he knows it can't jump out.	
Then he took the baby frog home with him.	
He lived happily ever after.	(+ Outcome)

Table 3. *Descriptions of the initiating event and five episodes in* Frog, Where are You? (Mayer, 1969)

Description	Picture plates
Initiating event: Pet frog escapes while the boy and dog are sleeping	1—3
Episode 1	
Begin searching for missing frog	4—7
Goal: find frog in/near house	
Attempt	
characters looking in room	
characters looking from window	
boy calls out from window	
Outcome: frog is not located	
Episode 2	
Searching outside near the boy's house	8—10
Goal: find missing frog in the tree	
Attempt	
calling for the frog	
looking for frog in a hole	
Outcome	
rodent bites boy on nose	
frog is not found	
Episode 3	
Searching near edge of forest	11—13
Goal: find missing frog in the tree	
Attempt	
boy climbs tree and looks into hole	
Outcome	
boy is knocked from tree	
chased away from tree by owl	
Episode 4	
Searching in forest	14—18
Goal: gets on boulder to locate missing frog	
Attempt	
boy climbs onto rock	
boy calls out for frog	
Outcome	
elk picks up boy	
elk runs to edge of cliff; throws boy over cliff and into the water	
Episode 5	
Searching near pond	19—24
Goal: find missing frog near the pond	
Attempt: boy and dog look behind log	
Outcome	
find many frogs	
boy leaves with baby frog	

the characters. Subjects must relate to the story pictures 'as predications of activities or happenings rather than as descriptions of objects or states' (Berman and Slobin, 1994, p. 51).

Being informative also means that the narrator may find it necessary to draw *inferences* that go beyond what is directly observable in the picture. For example, the setting for the first several *Frog* story pictures is the boy's bedroom. The opening page introduces the three main story characters: the boy, dog and frog. It is nighttime (a crescent moon is seen through an open window) and the boy and his dog are at the foot of a bed peering into a glass jar that contains the frog. In the second picture the frog is climbing out of the jar while the boy and dog are sleeping. In the third picture the boy and dog awake to find an empty jar. In order to generate an informative utterance for Picture 3, the narrator

must be able to *infer* what has happened from the previous two pictures. What is implied by the empty jar is that the frog has escaped while the boy and dog were sleeping. This inference is readily recognized and expressed by most school-age children, as illustrated in the following comment by a typically developing eight-year-old youngster. 'In the morning, the boy and his dog wake up and are surprised to see that the frog got away during the night.' In our scoring system this response would be *Informative* since the child encoded both of the picture's essential elements: (a) the boy and dog wake up; and (b) the frog is missing.

The coherence protocol we have developed contains descriptions of the essential informative elements for each of the 24 Frog story pictures. However, not every response produced by even excellent narrators might reasonably be expected to always contain the necessary or essential elements to be informative. Thus, our scoring system involves awarding a point in one of four categories for each of the 24 pictures. The four categories are: (a) *Informative*, as above; (b) *Vague*; (c) *Irrelevant/Inaccurate*, and (d) *No Response*. There are times when a narrator may simply comment on the obvious, or engage in picture description. Furthermore, it has been our experience that both younger and older students will, at times, use non-specific vocabulary or non-specific statements when talking about story pictures, and we have witnessed both typically developing and FAS subjects providing information that is only tangential to the story line. In our scoring system these types of responses are recorded as *Vague*. With regard to the *Irrelevant/Inaccurate* category, irrelevant utterances encode information that is not pertinent, germane or applicable to the story plot, whereas inaccurate utterances are ones that reflect information that is imprecise or incorrect. Based on our clinical experience and initial pilot data, neither of these by itself was uniquely present in the narratives of our FAS subjects. Thus, for our assessment purposes, Irrelevant and Inaccurate utterances function as a single category. The No Response category is used when a youngster fails to offer any information about a stimulus picture (e.g. skips over a page).

In summary, our assessment protocol has been constructed to elicit a spontaneous oral narrative. The eliciting stimulus is a wordless story book that portrays the adventures of a young boy and his dog who search for a missing frog. The story is built around an abstract organizational scheme or plot that includes an onset (the boy's realization that his frog has disappeared); an unfolding (the boy's search for his missing frog) and a resolution (the boy discovers his lost frog). The protocol is designed to analyse narrative cohesion (episodes) and coherence (informativeness) in school-age children and older youths.

Clinical application

Over the past 12 months we have piloted the narrative protocol in the Fetal Alcohol Syndrome Network Clinic at the University of Washington. We have used this experimental procedure with more than 100 individuals with documented histories of prenatal alcohol exposure. Thirteen school-age children and adolescents have received the diagnosis of fetal alcohol syndrome (FAS). Preliminary data indicate that this narrative protocol may have clinical utility as a criterion—reference measure. We now attempt to document the usefulness of the procedure with two case presentations.

Case presentation

Two adolescent males diagnosed with FAS served as subjects. A dysmorphologist with recognized expertise in the clinical diagnosis of FAS concluded that both subjects had the facial phenotype, cognitive and behavioural dysfunction and growth deficiencies consistent with this birth defect syndrome. At the time data were gathered, one subject was 14;3 years, the second 16;10 years. The younger subject was enrolled in regular public school classroom with resource room assistance. A school

psychologist reported a full-scale IQ of 72. This adolescent was characterized by his teacher as 'verbally intrusive' and 'extremely active but compliant'. While he exhibited a number of behavioural symptoms consistent with a diagnosis of attention deficit hyperactive disorder (ADHD), he did not meet criteria for the full ADHD syndrome. The older subject also attended a regular education classroom and, similar to the younger subject, participated in specialized classes for academic subjects. His full-scale IQ was 81. His teachers noted that he did not seem to learn from past experiences, needed considerable help in organizing daily tasks and did not appear to recognize the consequences of his actions.

The *Frog* story narratives of both subjects are presented in the appendix. Each narrative sample was transcribed in standard English orthography and re-transcribed to determine transcription accuracy. Point-to-point transcript reliability was above 90% for each sample. The story samples were then scored by one of the three investigators for their cohesive and coherent qualities. In addition, both samples were re-scored by a different investigator to obtain a measure of inter-scorer agreement. Point-to-point agreement for story cohesion (i.e. scoring Initiating Events and Episodes) and story coherence (i.e. scoring utterances for being Informative, Vague, Irrelevant/Inaccurate or No Response) exceeded 90%.

Our clinical intent is to use the *Frog* story as a criterion-reference tool. However, until we have some evidence of how typically developing children and adolescents perform, it is difficult to consider someone 'delayed', 'impaired' or 'atypical', regardless of the score they receive (Lahey, 1988). To establish an initial level of typical performance we collected, transcribed and scored for cohesion and story coherence 12 *Frog, Where are You?* narrative productions of typically developing students. Six of the narratives were elicited from adolescent students with a mean age of 14;3 years and six from older students whose mean age was 16;7 years. All 12 students attended public secondary schools and were enrolled in regular classrooms. According to their teachers, each student was performing at or above the class average in academic subjects. In addition, a psychologist reviewed school records for the 12 students and reported their intellectual functioning was within the normal range.

Table 4 presents cohesion results. The data summarize the frequencies with which the initiating event (IE) and five story episodes were produced by two adolescent youngsters with FAS and their typically developing peers (TDP). Neither FAS subject produced the essential features associated with the IE (i.e. that the boy and the dog are sleeping), nor did either subject produce a complete story episode. Although preliminary in nature, the robust differences between the FAS and TDP subjects' performances support clinical observations and parental contentions that youngsters with FAS do not seem to understand and/or convey the logical links among a series of related events.

Table 4. *Frequencies of occurrence for the initiating event and five story episodes spontaneously produced by two adolescents with fetal alcohol syndrome and 12 typically developing peers for* Frog, Where are You? (Mayer, 1969)

	Fetal alcohol syndrome adolescents (*n*=2)	Typically developing peers (*n*=12)
Initiating event	0	10
Story episodes		
1	0	10
2	0	8
3	0	8
4	0	9
5	0	9

Table 5 presents evidence regarding story coherence. Absolute and proportional frequencies for *Informative, Vague, Irrelevant/Inaccurate*, and *No Response* statements are presented. Visual inspection of the table

reveals that the vast majority of statements for the two subjects with FAS were categorized as Vague (i.e. mean = 71%). The proportions of *Vague* statements of each of the two FAS adolescents were quite similar to each other (i.e. 75% for Subject 1 and 67% for Subject 2). Both subjects used a preponderance of implicit, non-specific statements that obscured main ideas and/or failed to go beyond what was immediately available in the pictures. In contrast, the mean proportion of *Vague* statements generated by the 12 TDPs was 48%.

The number of *Informative* statements produced by the two FAS adolescents was somewhat variable. Subject 2, for example, produced eight story pictures that met the *Informative* criteria (i.e. 33%), whereas Subject 1 had only one picture that coded these essential elements (i.e. 4%). The profile for the 12 TDPs was remarkably different. Whereas the mean proportion of *Informative* statements for the two FAS subjects was 19%, the TDPs averaged 48%. To our way of thinking, these performance differences are not only robust but, more importantly, clinically meaningful.

Interpretation

The performance profiles between the adolescents with FAS and their typically developing, chronological-age matched peers (TDP) clearly differ. While the *Frog* narratives of the TDPs reflected logical organizational schemes, neither FAS subject generated stories that contained a basic plot structure. Both youngsters lacked an initiating event at the beginning of their stories and failed to use their language to link goals, attempts and outcomes into story episodes. As a result, their *Frog* stories were, for all intents and purposes, a truncated set of utterances largely devoid of hierarchical connections.

The coherence data are also revealing. Because FAS disrupts the social-communicative functions of language, it was not particularly surprising to find that adolescents with FAS produced significantly fewer informative statements than the TDPs. However, it was instructive to learn that the FAS subjects rarely related irrelevant or inaccurate statements in their extended texts. This finding suggests that the reason discourse narratives of FAS adolescents are hard to follow is because they fail to encode necessary inferences, not because they include information that is incorrect or unrelated to an underlying story plot.

Table *5. Absolute (and proportional) frequencies for Informative, Vague, Irrelevant/Inaccurate, and No Response statements produced by two adolescents with fetal alcohol syndrome (FAS) and 12 typically developing peers (TDP) for* Frog, Where are You? *(Mayer, 1969)*

	Story coherence categories Number/24 possible (%)			
	Informative	Vague	Irrelevant/ inaccurate	No response
FAS Subjects (n=2)				
1 (14;3 years)	1 (4%)	18 (75%)	4 (17%)	1 (4%)
2 (16;10 years)	8 (33%)	16 (67%)	0	0
Mean Percentages	*(19%)*	*(71%)*	*(17%)*	*(4%)*
TDP Subjects (n= 12) 14-year-olds				
1	*15 (63%)*	9(38%)	0	0
2	*8 (33%)*	14 (58%)	2 (8%)	0
3	*10 (42%)*	12 (50%)	2 (8%)	0
4	*12 (50%)*	12 (50%)	0	0
5	*11 (46%)*	10(42%)	3 (12%)	0
6	*9 (38%)*	13 (54%)	2 (8%)	0
1 6-year-olds				
7	12 (63%)	10 (42%)	2 (8%)	0
8	16(33%)	8(33%)	0	0
9	10 (42%)	12 (50%)	2 (8%)	0
10	10 (50%)	14 (58%)	0	0
11	11(46%)	13 (54%)	0	0
12	12 (50%)	11(46%)	1 (4%)	0
Mean Percentages	*(48%)*	*(48%)*	*(4%)*	*0%*

Caveat

A criterion-reference measure reveals how well an individual has established a particular *behaviour-of interest.* Thus, story cohesion and coherence data for the TDPs reported in tables 4 and *5,* respectively, are not intended as reference norms against which to compare the two narratives from the adolescents with FAS. Instead, these data are offered at this time to provide the reader with a *perspective* regarding the frequency of occurrence of important narrative components in a small group of typically developing adolescents. The evidence would seem to indicate that youngsters with FAS possess an insufficient ability to manage extended units of texts. Since processing longer units of text is an essential component of social communication (Walker *et* al., 1994; Larson and McKinley, 1995), the narrative protocol presented above might eventually be able to determine how well a child or adolescent had established the discourse skills of narratives. This would be an important step in determining whether the social—communicative profiles associated with FAS are distinct from other atypical populations, such as MA-matched, mentally retarded peers without histories of prenatal alcohol exposure.

Conclusion

The purpose of this paper has been to present a protocol for analysing narrative productions in older school-age children and adolescents. We have argued that, because narratives obligate speakers to make inferences, link ideas and take the perspective of others, they offer clinicians a meaningful alternative by which to examine the social—communicative processes of older youths with FAS.

The experimental protocol was designed to assess two social—communicative behaviours presumed to underlie the ability to 'capture and convey events in the world' (Berman and Slobin, 1994, p. ix). The first behaviour, cohesion, reflects the individual's competence in connecting a series of events into a logical system or structure. The second behaviour, coherence, is an indication of how effective an individual is in communicating the essential elements of a situation. Since cohesion and coherence have been reported in the literature to be key components of narrative discourse (see Berman and Slobin, 1994; Paul, 1995), they are particularly well suited for clinical assessment.

The preliminary data presented in this paper reveal the clinical utility of narrative analysis. The goal has been to determine whether youngsters with FAS possess sufficient ability to derive inferences and conclusions from a specific text and then communicate that information effectively to a listener. In the case of the two adolescents with FAS described in this paper, the evidence suggests that their repertoire of narrative abilities is seriously compromised. This finding leads us to speculate that both adolescents lacked social—communicative functions that are essential for academic success and social acceptance.

To our way of thinking, the protocol is a criterion-referenced measure that may eventually be able to determine how well a youngster has established cohesion and coherence. Admittedly, we currently lack a comprehensive and theoretically satisfying understanding of narrative discourse and how youngsters manage to relate longer units of discourse at different developmental levels. It is possible, therefore, that the story components and specific behaviours that define cohesion and coherence may be altered as additional information becomes available. However, at this juncture, this clinical protocol appears to be a reasonable tool for observing and analysing narrative productions in older school-age children and adolescents.

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Appendix

The oral narratives for *Frog, Where are You?* (Mayer, 1969) of two adolescent males with Fetal Alcohol Syndrome.

14;3-year-old FAS adolescent

> (It) this about a frog that (th) this kid found outside. (And he) and he says, ‘Oh I like that frog’. And he says, ‘I’m gonna keep it forever’. Then he when he went to sleep. And the frog says, ‘Oh, I’m out of here’. And then he goes, ‘Oh man the frog is gone’. (And he) then he goes, ‘Hey are you in my shoe’? And he says ‘Nope, not in my shoe’. And the dog says, ‘Nope, not in this bowl’. ‘Hey frog are you out this window’? And then the dog goes, ‘Woh’ and falls out the window. And then the boy is going, ‘uh-oh’. He picks up the dog and says, ‘You a naughty dog’. Then he says, ‘Frog where are you’? And the dog goes, ‘Ooo bees’. And then he says, Frog, are you in there’? Goes, Ooo stinks’. Then the dog is going, ‘Ooh I want some honey’. And then the boy goes in the tree. And the dog goes in the tree. And the dog goes, ‘Ah, bees’. And then he goes, ‘Woa’. (He falls) he falls out the tree. Then the dog is going, ‘aaah’. (He is running) he is running away from the bees. Then the boy is going, ‘Hey, get away from me’.

‘Stop it’. And the dog is going ‘Oh, I’m so scared’. ‘Ouch’. Then the boy is saying, ‘Frog where are you’? And then he goes, ‘Woa what happened’? And then he is running. And then he said, ‘Hey get off here, ahhh’. (Then he goes) then the dog and the boy goes, ‘Woa help’. And then they go (Splash sound). And they fall in the pond and go, ‘Hey, get of me you dumb dog’. And the he goes, ‘Hey I hear something’. And then he goes, Shhh, be quiet’. ‘I don’t want to scare him’. And then they climb over and say, Oh, I see you’. And they both peek in. And they saw baby frogs in there. And then they go, ‘Oh, thank you, bye’

16,10 year-old FAS Adolescent

Once upon a time there was a boy, a dog and his frog. One day (the) while the boy was sleeping the frog decided to get out. The next morning the boy woke up. And the frog was gone. The boy looked high and low. He looked all over with his dog but could not find him. (He) he opened up the window and looked out. He called for him. Did not find him. (The dog) the dog fell out the window. And the boy went out and got his dog. And then the boy went out calling for his frog with his dog. And the boy looked in a gopher hole and did not find him. What he found was a gopher that bit his nose. And what the dog found was a beehive. And then the boy climbed up in the tree; Looked in the tree. He did not find the frog but found an owl. And the dog was getting chased by the bees. The boy was getting chased away by the owl. The boy climbed up on a rock; Called for the frog. Did not find the frog but found a buck. The buck took him to the end of a cliff. Dropped him off. The boy fell off the cliff landed in the water with his dog. The boy and his dog was sitting in the water. Were listening. Heard something. Got up. Were being real quiet. Went up next to a log. Looked over the log. And there (were the) were his frog and a mate. So he climbed over and saw a bunch of other little frogs. (So his frog gave the boy) the frog gave (one) the boy one of his babies. And he lived happily ever after.