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**Narration and Collaborative Conversation in French-Speaking Children
with Williams Syndrome**

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Narration and Collaborative Conversation in French-Speaking Children with Williams Syndrome

Abstract. Williams syndrome (WS) is a rare genetic disease with a specific neuropsychological profile. WS people are generally described as being "hypersociable" and as having relatively well-preserved language abilities despite cognitive retardation. Recent research into the structural aspects of their language and their sociability has found nonhomogeneous profiles (with strong and weak points) in these two areas. The goal of this study was to show that the findings are analogous for the pragmatic facet of WS language. We also looked into the source of this heterogeneity by comparing performance on two contrasted tasks: narration and collaborative conversation. Twelve native French-speaking WS children and adolescents ages 6;6 to 18;11 years participated in the study. They were compared to children with Down's syndrome, and to typical children of the same chronological age or the same mental age. The results showed that the pragmatic abilities of the WS children and adolescents defined a unique profile: they were proficient in some areas (narration), deficient in others (collaborative conversation), and atypical in still others (expression of subjective views or feelings).

Keywords: Pragmatics, Williams syndrome, Narrative, Conversation, Sociability, Language.

INTRODUCTION

For about twenty years now, researchers in the cognitive sciences have taken an interest in individuals suffering from Williams syndrome (WS), a rare genetic disease (1 out of every 20000 births) caused by a microdeletion on the long arm of chromosome 7 (7q11.23) that results in the loss of about 16 to 25 genes (Siegmüller & Bartke, 2004; Bellugi, Lichtenberger, Jones, Lai, & St George, 2000; Karmiloff-Smith, 1998). Physiologically, persons with WS are characterized by a heart condition (supravalvular aortic stenosis) and a facial dysmorphology that makes them look elflike. From the cognitive standpoint, these persons have an Intelligence Quotient (IQ) that usually falls between 40 and 70, and they differ from other typical and atypical populations by their unique neuropsychological profile characterized by an apparent dissociation between cognition and language: language seems to be relatively well-preserved while cognitive activities (especially visuospatial construction, planning, problem solving, and numerical skills) are impaired (Karmiloff-Smith, Thomas, Annaz, & al., 2004; Pezzini, Vicari, Volterra, Milani, & Ossella, 1999; Klein & Mervis, 1999; Bertrand, Mervis, & Eisenberg, 1997). Another characteristic of WS persons is their hypersociability (Tager-Flusberg & Sullivan, 1999; Dykens & Rosner, 1999; Sarimski, 1997; Gosh & Pankau, 1994), particularly their ease of interaction with unfamiliar persons (Jones, Bellugi, Lai, Chiles, Reilly, Lincoln, & Adolphs, 2000; Doyle, Bellugi, Korenberg, & Graham, 2003; Frigerio, Burt, Gagliardi, Cioffi, Martelli, Perrett, & Borgatti, 2006).

Although WS persons are classically described as having relatively well-preserved structural language abilities and a high degree of sociability, recent research and analyses suggest that their skills are not homogeneous in either of these domains: they are proficient in certain areas of language structure but not in others, and some but not all aspects of sociability are well developed. This new perspective supplied the framework for the present study of French-speaking children and adolescents aimed at examining the pragmatic aspects of language, at the interface between language structure and sociability. It was hypothesized that certain pragmatic skills correspond to the strong points of persons suffering from WS, while others represent their weak points. We labelled the performance of the WS children in terms of "strong points" and "weak points" in order to bring out the nonhomogeneous profile of this population. Note, however, that the "weak" and "strong" labels were always assigned relative to the performance of a comparison group (typical children of the same chronological age or same mental age, children with Down's syndrome).

As stated above, research on the structural aspects of WS language (Stojanovik, Perkins, & Howard, 2004; Grant, Valian, & Karmiloff-Smith, 2002; Clahsen & Almazan, 1998; Karmiloff-Smith, Grant, Berthoud, Davies, Howlin, & Udwin, 1997) indicates a nonhomogeneous profile. For example, the lexical and semantic aspects of language appear to be less impaired than the morphological and syntactic aspects. Studies on morphosyntax in French-speaking participants (Karmiloff-Smith, Grant, Berthoud, Davies, Howlin, & Udwin, 1997; Monnery, Seigneuric, Zalbar, & Robichon, 2002) point in the same direction: depending on the study and the task, children with WS have varying degrees of difficulty. Research on sociability in English- and Italian-speaking WSs (Doyle, Bellugi, Korenberg, & Graham, 2003; Mervis, Morris, Klein-Tasman, Bertrand, Kwitny, Appelbaum, & Rice, 2003; Gagliardi, Frigerio, Burt, Cazzaniga, Perrett, & Borgatti, 2003; Tager-Flusberg, Plesa-Skwerer, Faja, & Joseph, 2003; Jones et al., 2000; Tager-Flusberg & Sullivan, 2000; Tager-Flusberg, Boshart, & Baron-Cohen, 1998) also points to a nonhomogeneous profile. For instance, studies on social behavior and the expression of emotions indicate that WSs perform relatively well in these two areas while being impaired in the recognition of emotions. The same has also been observed in French-speaking WS children (Deruelle, Mancini, Livet, Cassé-Perrot, & de Schonen, 1999).

Studies on the pragmatic aspects of language in persons suffering from WS are rare and have focused mainly on assessing communicative, narrative, and conversational skills independently. The sociable behavior often described in WS individuals sometimes evokes a "cocktail party speech" type of attitude. The individual is extremely friendly, has a tendency to talk a lot, and is apparently very interested in others, yet he/she also seems to have a superficial understanding of the exchanges taking place. As a consequence, the social behavior of WS children does not characteristically exhibit deep social involvement with others, and their social relations remain superficial (Laws & Bishop, 2003; Gagliardi et al., 2003; Johnson & Carey, 1998). Some studies have attempted to gain further insight into this behavior by looking in particular at the conversational and communicative skills of the WS. In their study, Mervis, Klein-Tasman, and Mastin (2001) used the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984) to assess the ability of 4- to 8-year-old WS children to adapt to surrounding individuals. To fill out the Vineland questionnaire, they conducted semi-structured interviews with 41 parents to assess the WS children's communication skills, daily living skills, socialization level, and motor abilities. Based on the results, the children's capabilities were ranked as follows: socialization (strongest point), communication, daily living skills, motor abilities (weakest point). It is noteworthy that the

WS children's abilities improved with age. In the Laws and Bishop (2004) study, parents, teachers, and other professionals were asked to fill out the Children's Communication Checklist for WS, Down's syndrome (DS), specific language impairment (SLI), and typical populations. This checklist, which is a 70-item questionnaire aimed at detecting communication problems, evaluates various categories such as coherence, inappropriate initiation, the use of context, nonverbal communication, and social relations. The participants were 19 WS persons aged 6 years 5 months to 25 years 2 months, 24 DS persons aged 10 years 2 months to 22 years 9 months, 17 SLI children aged 4 years 5 months to 7 years 2 months, and 31 typical children aged 4 years 11 months to 6 years 8 months. Although the pragmatic scores of the three clinical groups were below those of the typical group, only the WS group had a score below the impairment cutoff point. This means that the persons suffering from WS had a real pragmatic deficit characterized by inappropriate initiation of interactions and stereotyped conversations. Jones et al. (2000) also demonstrated inappropriate initiation involving a lack of inhibition with respect to unknown persons. The Mervis et al. (2001) and Laws and Bishop (2004) studies once again stress the nonhomogeneous capacities of WS individuals, with their relatively good ability to socialize but difficulty interacting in a suitable way with others.

Concerning narration, Losh, Bellugi, Reilly, and Anderson (2001) and Reilly, Losh, Bellugi, and Wulfeck (2004) looked at the development of narrative abilities in WS children between the ages of 5 and 13. WSs were compared with SLI children and with typical children matched on chronological age, lexical development, and nonverbal development. The participants, who were English speakers, had to tell the story entitled "Frog, Where Are You?" (Mayer, 1969). The authors were interested in the structure of the child's storytelling, which they measured in terms of the ability to elaborate the story schema. The results indicated that the SLI participants established and maintained the theme as efficiently as the same-chronological-age typical children, but the WS group had more trouble than both the SLI children and the same-chronological-age typical children. In addition, the authors looked at social evaluations, which serve to assess the speaker's subjective point of view with respect to the listener and the story. The coding was based on three categories: social involvement cues (sentences and exclamations to attract the listener's attention, such as sound effects like "*splash!*") and character dialogues like "*And the boy says, 'The jar is broken!'*"), references to affective states and behaviors (attribution of mental states to characters as in "*The boy is crying.*"), and intensifiers (repetitions or emphatic markers like "*It's so beautiful!*"). The WS children were found to use more social evaluations than their SLI peers and their typical

same-chronological-age or same-mental-age peers. This study brought out the ability of WS children to stage their narratives by putting themselves in the shoes of the story characters (use of dialogues between characters and attribution of affective states). Italian- and French-speaking WS children and adolescents have also been shown to do more social evaluating than their typical peers (Reilly, Bernicot, Vicari, Lacroix, & Bellugi, 2005). As a whole, these results (Losh et al., 2001; Reilly et al., 2004) stress the nonhomogeneous character of the narrative skills of the WS, with a deficit in narrative structuring and an overly heavy use of social evaluations. Their tendency to make more social evaluations is compatible with the hypersociability generally described in these individuals.

In the area of conversation, Stojanovik, Perkins, and Howard (2001) and Stojanovik (2006) focused on the ability of WS children to produce appropriate conversation. The participants in their studies were five WS children ranging in age from 7 years 6 months to 12 years 1 month, eight SLI children ranging from 9 years to 12 years 4 months, and nine typical children ranging from 6 years 8 months to 12 years. Each child was tested five times via a semi-structured conversation about a series of photographs showing everyday scenes. Exchange structure, turn-taking behavior, information transfer, and conversation adequacy were analyzed. Exchange structure was coded in terms of initiations that called for/did not call for a response from the interlocutor, short replies, long replies, and exchange continuity; turn-taking violations were categorized as no response, deliberate or undeliberate overlapping, and interruption by the adult because the child's remark was unclear; information transfers were coded as explicit requests for information, requests for clarification, and requests for confirmation; and conversational adequacy was measured in terms of language structure and pragmatics (misunderstanding of inferences, failure to make use of the context, too much information, not enough information, and inappropriate style). The results indicated that the WSs' responses were longer than those of the SLIs but were not always relevant. Some of the utterances produced by the WS children were inappropriate due to semantic and syntactic problems. Compared to the typical children, the WSs supplied very little information despite their reputation of being very talkative. There was no difference between the groups on turn-taking violations, but the WS and SLI children's replies to adult requests were not as well-adapted as those of the typical children. Thus, it seems that WS children have relatively poor conversational skills: they talked less than the typical children and they did so in an inappropriate way.

These initial studies confirm the idea that the abilities of the WS in the area of language pragmatics are not homogeneous. They exhibit strong points (good communication

level as assessed via questionnaire, atypical ability to stage a narrative, i.e., WS scores are above those of all matched groups) and weak points (inadequate narrative structure, poor and inappropriate participation in interactions). Our goal here was to gain further insight into this profile by comparing the same participants on two tasks. We asked the same WS children and adolescents to perform two highly contrasted language production tasks: a narrative task and a collaborative conversation task. Each task had different constraints. During the narration, a listener was present but did not speak as the participant freely told a story. The only constraint was that the story had to follow the pictures shown. By contrast, the collaborative conversation task involved a verbal exchange between two speakers and required adapting to the other person in order to jointly achieve a specific goal. We hypothesized that the WS would encounter more pragmatic difficulties in the task where they had to adapt to the interlocutor, i.e., they would have more trouble in collaborative conversation than in narration. In order to accurately detect the WSs' strong and weak points, we compared the WS group to a DS group (same cognitive lag and same chronological age) and to two typical groups, one of the same chronological age and one of the same overall mental age. This would allow us to show that the performance differences of Williams syndrome participants are task-dependent.

EXPERIMENT 1: NARRATION

1.1 Participants

Four groups of children were set up. The first group (WS) was composed of twelve children and adolescents with WS whose mean age was 12 years 4 months (range: 6 years 6 months to 18 years 11 months) and whose average IQ was 53 (range: 41 to 74). The WS diagnosis was confirmed by a genetic test called FISH (fluorescent in situ hybridization). The second group (DS) was composed of twelve children and adolescents with Down's syndrome whose mean age was 12 years 5 months (range: 6 years 9 months to 18 years 7 months) and whose average IQ was 47 (range: 40 to 55). The DS diagnosis was made by means of karyotyping. The DS participants were matched to the WS group on gender, chronological age, IQ, and the family's socio-economic standing. IQ was measured on the Wechsler Scales (Wechsler, 1996 – French version). The third group (CA) was made up of twelve typical children and adolescents matched to the WS group on gender, chronological age, and socio-economic standing. The participants in this group averaged 12 years 4 months in age (range: 6

years 7 months to 18 years 8 months). The fourth group (MA) contained twelve typical children and adolescents matched to the WS group on gender, mental age, and socio-economic standing. The mean age of this group was 6 years 9 months (range: 4 years 3 months to 9 years 8 months). Socio-economic standing was determined on the basis of the parents' occupations.

The families with a Williams syndrome or Down's syndrome child were contacted through associations of parents of children with each these disorders, and through specialized institutions. The typical children were all enrolled in the normal school grade for their age.

1.2 Materials and Procedure

An individual narrative task was prepared from Mayer's (1969) book entitled "Frog, Where Are You?" This book contains 24 black and white pictures without text and tells the story of a little boy who loses his frog. He goes to look for "her", and after a series of adventures, finds her at last. The conventional testing procedure was used (Berman & Slobin, 1994): the pages are turned one after the other by the child or the experimenter. During the first phase, the child looks at the pictures without speaking. During the second phase, the child has to tell the story while looking at the pictures one by one. The testing session was videotaped. The children's productions were transcribed, picture by picture, according to the CHAT criteria (CHILDES: MacWhinney, 2005).

1.3 Coding

Narrative is a language genre defined by culturally-determined rules. The rules are based on the idea that to tell a story, one must communicate, which requires following a fundamental rule: the narrative must be understandable to a listener who does not know the story. The storyteller must therefore keep to the canonical narrative schema (the set of episodes that constitute the story) and maintain the main theme by reiterating it in the course of the narration. Berman and Slobin's (1994) study showed that young children (4-5 years old) have a strong tendency to tell stories from a subjective point of view, i.e., they add elements to the narrative. On this basis, four indexes were considered here: the number of utterances, elaboration of the story schema (culturally transmitted), reiteration of the story's theme (seeking a solution to a problem as the plot gets increasingly complex), and social evaluations.

An utterance was defined as a proposition that included a verb, such as "*The boy is yelling through the hole.*"

The story schema can be defined as consisting of four sequences of ordered events that make up the plot (Berman & Slobin, 1994): onset, complexity, unfolding, and resolution. Each participant was assigned a score between 0 and 14 on the basis of the presence, in the proper order, of the essential events in the story.

The theme of "Frog, Where Are You?" is the little boy's search for his frog. A score between 0 and 3 was assigned according to how well this theme was brought out. Measures of both story-schema elaboration and story-theme reiteration were needed in order to assess the participant's mastery of the narrative structure: indeed, a child could very well detect and describe all of the story's episodes without really bringing out the theme.

Social evaluations (see Losh et al., 2001; Reilly et al., 2004) serve to assess the speaker's subjective point of view with respect to the listener and the story. When narrating, we describe events, we make sure we are capturing the listener's attention, and we express our point of view about the story. The number of social-evaluation utterances produced by the participant was divided by the total number of utterances and then multiplied by 100. The coding grids for elaboration of the story schema and reiteration of the story's theme are presented in Table 1; the grid for social evaluations is presented in Table 2.

Insert Table 1

Insert Table 2

1.4 Results

For each dependent variable, the data were analyzed statistically by an analysis of variance with one, four-category factor: group (WS, DS, CA, and MA). When necessary, this analysis was supplemented by pairwise comparisons. Differences were considered significant starting at a p-level of .05. Table 3 presents the narrative task results (means and standard deviations).

Insert Table 3

1.4.1 Number of utterances. The ANOVA showed that the group effect was significant ($F(3,44) = 8.12, p < .001$). WS participants produced more utterances than DS participants ($F(1,44) = 6.47, p < .05$) but fewer than CA participants ($F(1,44) = 5.52, p < .05$) and as many as MA participants. The DS group produced fewer utterances than the CA group ($F(1,44) = 23.96, p < .0001$) and as many as the MA group, and the CAs produced more

utterances than the MAs ($F(1,44) = 8.56, p < .01$). In short, the WS children and adolescents produced more utterances than their DS peers, about the same number as the typical MAs, and fewer than the typical CAs.

1.4.2 Elaboration of the story schema. The ANOVA yielded a significant group effect ($F(3,44) = 24.78, p < .0001$). The participants in the WS group obtained more points for schema elaboration than did DS participants ($F(1,44) = 21.08, p < .0001$), fewer points than CAs ($F(1,44) = 13.99, p < .001$), but as many points as MAs. DS participants obtained fewer points for the schema than CA participants ($F(1,44) = 68.32, p < .0001$) and MA participants ($F(1,44) = 39.01, p < .0001$). Finally, CA participants obtained more points than MA participants ($F(3,44) = 4.08, p < .05$). Thus, the WS children and adolescents structured their narratives better than the DSs, as well as the MAs, but worse than the CAs.

1.4.3 Reiteration of the story's theme. The ANOVA yielded a significant group effect ($F(3,44) = 12.77, p < .001$). The participants in the WS group obtained more points for reiteration of the story's theme than the DS group did ($F(1,44) = 5.36, p < .05$) but fewer than the CA group ($F(1,44) = 12.07, p < .005$) and the MA group ($F(1,44) = 4.35, p < .05$). DS participants obtained fewer points than CA participants ($F(1,44) = 33.53, p < .001$) and MA participants ($F(1,44) = 19.37, p < .001$). Finally, CA participants obtained as many points as MA participants. Thus, the WS children and adolescents reiterated the story's theme better than the DSs but not as well as the CAs and MAs.

1.4.4 Social evaluations. The ANOVA indicated a significant group effect ($F(3,44) = 10.56, p < .0001$). The WS group produced more social evaluations than the DS group ($F(1,44) = 25.39, p < .0001$), the typical CA group ($F(1,44) = 21.30, p < .0001$), and the typical MA group ($F(1,44) = 14.07, p < .001$). DS participants and typical CAs and MAs made an equal number of social evaluations. Thus, social evaluations were found more often in the narratives of the WS children and adolescents than in those of the other groups.

1.4.5 Summary of results. For the number of utterances, story-schema elaboration, and story-theme reiteration, the WS children and adolescents exhibited "intermediate" performance, that is, they did better than the DS group (same IQ and same chronological age) but not as well as same-chronological-age typical children. In the area of expressing a subjective point of view by means of social evaluations, the WS children and adolescents performed atypically, since they made many more social evaluations than did their DS, CA, and MA peers.

Now that we have looked at the pragmatic skills of WS children and adolescents in a story-telling situation, let us turn to their pragmatic skills during collaborative conversation, where adaptation to the interlocutor is crucial.

EXPERIMENT 2: COLLABORATIVE CONVERSATION

2.1 Participants

The participants were the same as in Experiment 1. All of the children interacted with their mother. We chose the most familiar interlocutor (the mother) so the children would begin interacting quickly and easily, and because we wanted to obtain data for exchanges taking place in an everyday setting.

2.2 Materials and Procedure

The mother and the child had to carry out a task together, namely, reproduce a drawing using the Kid Pix drawing program (Hickman, 1991). The materials consisted of a computer, two computer mice, and a drawing of a circus. Each member of the dyad had his/her own mouse, but there was a special device that allowed only one mouse to function at a given time. This setup prevented one person from drawing unless the other person agreed, in such a way that to reach the task goal (reproduce the drawing), discussion and negotiation were necessary. The same drawing was shown to all children. The testing session was videotaped. Note that all of the children, regardless of their age or group, successfully reproduced the drawing in collaboration with their mother. Two 15-minute learning sessions were held separately with each member of the dyad, one for learning how to use the mouse and the other for familiarization with the drawing program. During the experimental phase, the mother and child were seated facing the computer so that both the screen and the to-be-reproduced drawing would be equally accessible to the child and the mother. After giving the instructions orally, the experimenter stayed for the first two minutes as the participants worked together, and then left the room so they could work alone for the remaining 20 to 30 minutes.

2.3 Coding

The first two minutes of the conversation, which corresponded to the time needed to get set up, were not analyzed. The next fifteen minutes were coded. Speaking turns were determined on the basis of two criteria: a change of speaker and/or silence for more than two

seconds. To delineate the utterances, we used the grid devised by Bernicot, Comeau, and Feider (1994).

Three main types of indexes were defined for our analysis: the overall structure of the conversation, the production of speech acts, and the understanding of directives (requests). For the overall structure of the conversation, two indexes were used to measure the absolute and relative quantity of speech produced by the child: the number of utterances, and the child-to-mother speaking-turn ratio. An utterance was defined as a proposition delineated according to Bernicot et al.'s (1994) criteria. After counting the child's and the mother's speaking turns, we divided the number of child speaking turns by the number of mother speaking turns to obtain a measure of the child's ability to take part in the conversation. The closer this index is to one, the more balanced the conversation. Values below one mean that the mother spoke more than the child.

Searle and Vanderveken's (1985) speech-act classification was used to label each of the child's utterances as an assertive, a directive, an expressive, or a commissive (there were no declarations in our corpus) (see Table 4). The number of utterances corresponding to each speech act was divided by the total number of utterances and then multiplied by 100.

Insert Table 4

The directives produced by the mother were broken down into two subclasses: maternal directives carried out by the child and maternal directives not carried out by the child. The coding process thus required taking three speaking turns into account: the mother's initial directive utterance, the child's response, and the mother's response expressing request satisfaction or nonsatisfaction. Table 6 presents only those elements that entered into determining whether or not the directives were carried out. The number of unsatisfied directives was used as an index of the child's difficulty adapting to and collaborating with his/her interlocutor. The number of unsatisfied directives was divided by the total number of directives and then multiplied by 100.

2.4 Results

For each dependent variable presented above, statistical analyses were conducted using an analysis of variance with one, four-category factor: group (WS, DS, CA, and MA). Whenever necessary, this analysis was supplemented by pairwise comparisons. Differences

were considered significant starting at a p-level of .05. Table 5 presents the results (means and standard deviations) for the collaborative conversation task.

Insert Table 5

2.4.1 Overall structure of the conversation. Two dependent variables were studied: the number of utterances and the child-to-mother speaking-turn ratio.

2.4.1.1 Number of utterances. The ANOVA showed that the group effect was significant ($F(3,44) = 7.21, p < .001$). WS participants produced as many utterances as DS participants but fewer than CA participants ($F(1,44) = 17.75, p < .001$) and MA participants ($F(1,44) = 6.02, p < .05$). The DS group produced fewer utterances than the CA group ($F(1,44) = 12.72, p < .001$) and as many as the MA group. The CA and MA groups did not differ from each other. Thus, the WS children and adolescents, like their DS peers, produced fewer utterances than the typical CAs and MAs. The small amount of talking done by the WS group had no effect on the other dependent variables considered: for each of these variables, the measures were always divided by the total number of utterances or the total number of directives produced by that participant.

2.4.1.2 Child-to-mother speaking-turn ratio. Recall that after counting the child's and the mother's speaking turns, we divided the number of child speaking turns by the number of mother speaking turns to obtain a measure of the child's ability to take part in the interaction. The closer this index is to one, the more balanced the interaction. The ANOVA indicated a significant group effect ($F(3,44) = 4.24, p < .05$). The children in the WS group took as many speaking turns as the children in the DS group, but fewer than the CA children ($F(1,44) = 7.91, p < .01$) and the MA children ($F(1,44) = 4.12, p < .05$). The same result was obtained for the DSs, who took fewer speaking turns than did the CAs ($F(1,44) = 8.37, p < .01$) and the MAs ($F(1,44) = 4.46, p < .05$). Finally, the children in the CA and MA groups did not differ from each other. Thus, the WS and DS children's and adolescents' conversations with their mother were less well-balanced (speaking-turn ratio: 6 to 10) than were those of the typical CA and MA participants (ratio: 8 or 9 to 10).

2.4.2 Speech acts produced. The purpose of the speech-act analysis was to determine what social functions were preferred by the children with Williams syndrome in this conversation situation. It would tell us whether the WS children had a greater tendency to describe the world (assertives), formulate a request (directives), express a mental state (expressives), or make a promise (commissives). Given that there were too few commissives,

the statistical analysis dealt solely with assertive, directive, and expressive acts. No significant difference was found between the four groups on assertives or directives. Thus, when it came to stating a belief about the world or attempting to make someone do something, the WS, DS, and typical children acted in a quantitatively similar way. For expressive speech acts, the ANOVA yielded a significant group effect ($F(3,44) = 3.29, p < .05$). WS participants produced more expressive utterances than did DS participants ($F(1,44) = 5.79, p < .05$) and CA participants ($F(1,44) = 8.66, p < .01$). But the WS group produced as many expressive utterances as the MA group. The DS, CA, and MA groups did not differ. Thus, the WS children and adolescents produced more expressive utterances than their DS and typical CA peers but as many as their typical MA peers.

2.4.3 Children's responses to mother's directives. The statistical analysis pertained to the directives produced by the mother but not carried out by the child. The ANOVA yielded a group effect ($F(3,44) = 18.79, p < .0001$). The number of unsatisfied directives was greater for the WS group than for the DSs ($F(1,44) = 27.39, p < .0001$), CAs ($F(1,44) = 31.29, p < .0001$), and MAs ($F(1,44) = 48.90, p < .0001$). For the groups taken two at a time, there was no DS-CA or DS-MA difference, and no CA-MA difference. Thus, the WS children had a particularly hard time accomplishing the directives made by their mother, a difficulty that was not experienced by the DSs, whose behavior was like that of the typical participants.

2.4.4 Summary of results. In the collaborative conversation task, the WS children and adolescents spoke little: they acted like DS participants in that they produced fewer utterances than did typical participants and played a weak role in the conversation compared to their mother. However, they readily expressed their psychological state (like younger children of the same mental age), producing more expressive utterances than groups DS and CA. Thus, the WS children's and adolescents' behavior with respect to maternal directives was atypical: they satisfied these requests less often than all other groups.

GENERAL DISCUSSION

The goal of this study was to show that for persons suffering from Williams syndrome, the pragmatic aspects of language do not develop in a homogeneous way: they are proficient in some areas, which correspond to their strong points, and atypical in other areas, which correspond to their weak points or to excessive behavior. We compared the performance of children and adolescents on two contrasting tasks: narration, which consisted of telling a story

from pictures to a listener who said nothing, and collaborative conversation, which consisted of having the child and his/her mother make a drawing together in a situation requiring negotiation and adaptation to the other person. To determine their performance level, we compared the WS participants to a Down's syndrome group and to two typical groups matched on chronological age or mental age.

For the narrative task, our study showed that, although they did not do as well as typical CA children, the performance of these French-speaking WS children and adolescents (on schema elaboration and theme reiteration) was better than that of DS children of the same cognitive level. This finding supplements the results of Reilly et al.'s (2004) study on English speakers, where the WS group's performance was not as good as that of a group of SLIs. Concerning social evaluations, the profile of the WS children and adolescents was atypical, due to excessive social evaluating compared to children in groups DS, CA, and MA. This finding corroborates earlier results for English and Italian (Losh et al., 2001; Reilly et al., 2004; Reilly et al., 2005); it also supports the hypothesis that this is a WS-specific behavior, insofar as the DS group did not produce more social evaluations than the typical groups. If we use the DS group as a reference, then we can conclude that mastery of the story schema is a strong point among children and adolescents suffering from WS: they outperform others of the same cognitive level. A high frequency of social evaluations seems to be (i) specific to this disorder, (ii) excessive to the point of being atypical, and (iii) compatible with their high ability to express emotions (Gagliardi, Frigerio, Burt, Cazzaniga, Perrett, & Borgatti, 2003; Tager-Flusberg, Plesa-Skwerer, Faja & Joseph, 2003; Jones et al., 2000).

For the collaborative conversation task, the WS children and adolescents spoke little: like the DS group, they produced few utterances, and compared to their mothers they took far fewer speaking turns. This result is counter-intuitive, given that WS children and adolescents are said to be "talkative" and "voluble". But it is in line with the results for English obtained by Stojanovik et al. (2001) and Stojanovik (2006), who showed that WS children spoke less than SLI or typical children. Our data allow us to contend that WS individuals exhibit the behavior that corresponds to their cognitive level. The WS group produced more expressive utterances than the DS group and the typical CAs, a result which is consistent with their numerous social evaluations during narration. Finally, the WS children and adolescents responded less than the other three groups to directives produced by their mother. This behavior is a testimony to their difficulty adapting to their interlocutor. If we take the DS group as a reference, we can consider that the weak points of WS participants are: the number of utterances, the child-to-mother speaking-turn ratio, and carrying out directives; on these

measures, their performance was lower or equal to that of their cognitive level. As above for narration, the high frequency of expressive utterances appeared here as a disorder-specific, atypical behavior that is consistent with their highly developed skills in the expression of emotions.

It is interesting to note that, depending on the situation of communication (narrative vs. collaborative task) the verbal productions of the WS were different. Indeed, in the narration situation, WS children produced as many utterances as MAs, whereas in the collaborative task, they produced fewer utterances. In line with the literature on this issue, the mothers of atypical children (DS and WS) intervened more than mothers of typical children. They may therefore have been partly responsible for the difference found here between the atypical and typical children. In terms of speech quantity, the fact that the WS participants did a lot of speaking when narrating to a listener other than their mother, while talking little when collaborating with their mother, supports this interpretation. However, the fact that two of the WS children's collaborative interaction measures (expressives and directives) differed from those of DS children clearly shows that the mothers were not the sole source of the atypical children's behaviors.

In two cases, WS performance equalled that of the typical group matched on mental age: elaboration of the story schema in narration, and the use of expressives in collaborative conversation. These findings could be interpreted as indicating a developmental lag, especially for expressives, since the behavior of the WS children and adolescents resembled that of 3- and 4-year-old children, also shown to rely substantially on dialogues among story characters, sound effects, and prosody (Bamberg & Reilly, 1996). However, this explanation is not supported by the fact that the oldest WS adolescents (age 18), who had a mental age of 9 years, continued to over-use social evaluations (which the typical 9-year-old children did not do). The data showing that the WS group performed better, equally well, or worse than the DS group, depending on the index used to measure performance, also call for a more complex explanation than a mere developmental lag.

Research has progressively shown that persons with Williams syndrome have a nonhomogeneous profile (with strong points, weak points, and atypical behaviors) in the areas of language structure, sociability, and pragmatic language skills. In this last area, our comparisons between narration and collaborative conversation suggest that WS participants have well-preserved abilities when fine tuning to the interlocutor is not necessary (narration), but have trouble when addressee-adaptation is required (collaborative conversation). On both

of these tasks, the behavior of the children and adolescents with Williams syndrome was excessive when it came to expressing subjective viewpoints and feelings.

As far as language is concerned, persons suffering from Williams syndrome seem to exhibit a peculiar developmental pathway. Studying it can shed light on WS acquisition, not only of general language processes but also of other major functions like cognition and sociability.

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Table 1. Coding grid for elaboration of the story schema and reiteration of the story's theme on the narrative task (Experiment 1)

	<i>Characteristic</i>	<i>Points</i>
<i>Schema elaboration</i>	<p><u>Onset of the plot:</u> * 3 items had to be mentioned: bedroom, night, boy and dog looking at frog</p> <p><u>Complexity of the plot:</u> * the frog is gone/ has escaped/ has disappeared</p> <p><u>Unfolding of the plot</u> * boy searching * a mole * bees * an owl * branches * a deer * falling in water</p> <p><u>Resolution of the plot</u> * finding the frogs</p>	<ul style="list-style-type: none"> • 1 point for every element (labelled with an asterisk) present • Special case for animals (except the frog and the dog): 2 points if they are mentioned each time they appear in a picture
<i>Theme reiteration</i>	Explicit statement that the little boy is looking for his frog	<ul style="list-style-type: none"> <input type="checkbox"/> Mentioned once = 1 point <input type="checkbox"/> Mentioned more than once = 2 points <input type="checkbox"/> Mentioned throughout the story = 3 points

Table 2. Coding grid for social evaluations on the narrative task (Experiment 1), according to Losh et al. (2001) and Reilly et al. (2004)

<i>Category</i>	<i>Example</i>
Questions and exclamations directed at the experimenter	<i>C'est quoi ça?</i> (What's that?) <i>Tiens regarde!</i> (Here look!)
Emotional verbs	<i>il pleure</i> (he cries) <i>et puis i s'énerve finalement et le chien il est content</i> (and then he gets upset finally and the dog's happy)
Sound effects	<i>Ouah</i> (Wow) <i>Plouf</i> (Plunk)
Dialogues	<i>"le lit il est pas cassé?" demande le petit homme</i> ("the bed isn't broken?" asks the little man) <i>et le cerf i dit "ah! c'est bien fait!"</i> (and the deer says "ah! serves him right!")

Table 3. Results (mean and standard deviation) obtained for the pragmatic aspects of narrative (Experiment 1).

Number of utterances: mean number of propositions including a verb

Schema elaboration: number of points (maximum = 14)

Theme reiteration: number of points (maximum = 3)

Social evaluations: percentage of utterances containing a social evaluation

	WS	DS	CA	MA
Number of utterances				
Mean	56.75	31.67	79.92	51.08
Standard deviation	28.32	27.38	25.08	12.27
Group ranking		CA > MA = WS > DS		
Schema elaboration				
Mean	6.58	2.33	9.83	8
Standard deviation	2.90	2.60	1.27	1.81
Group ranking		CA > WS = MA > DS		
Theme reiteration				
Mean	1.5	0.67	2.75	2.25
Standard deviation	1.08	1.07	0.45	0.75
Group ranking		CA = MA > WS > DS		
Social evaluations				
Mean	22.26	2.57	4.21	8.76
Standard deviation	18.17	4.49	3.44	4.24
Group ranking		WS > MA = CA = DS		

WS = children and adolescents with Williams syndrome

DS = children and adolescents with Down's syndrome

CA = typical children of the same chronological age

MA = typical children of the same mental age

Table 4. Coding grid for speech acts and unsatisfied requests on the collaborative interaction task (Experiment 2)

Speech act	Description	Example
Assertive	The speaker states a belief about the world.	The sun is yellow.
Directive	The speaker tries to get the listener to do something.	Now you draw the house?
Expressive	The speaker expresses a psychological state concerning the state of the world.	The drawing is ugly!
Commissive	The speaker commits to doing something in the future.	I'm going to draw the roof.
Directive produced by mother and not satisfied by child	<p><u>Three elements are involved:</u></p> <p>a Speaker's utterance</p> <p>b- Listener's response: he/she refuses to accomplish the propositional content of the speaker's utterance.</p> <p>c- Speaker's reaction indicating non-satisfaction via reassertion of the request.</p>	<p><i>M: mother, C: child</i></p> <p>M9: So now you're going to find the yellow one.</p> <p>C8: No!</p> <p>M10: Yes.</p>

Table 5. Results (mean and standard deviation) for pragmatic aspects of collaborative interaction (Experiment 2)

Utterances: number of child utterances produced in 15 minutes

Speaking turns: child-to-mother speaking-turn ratio

Expressives: percentage of child utterances corresponding to an expressive speech act

Unsatisfied directives: percentage of maternal directives not accomplished by the child

	WS	DS	CA	MA
Utterances				
Mean	68.33	79.17	139	109.5
Standard deviation	36.22	34.68	57.15	31.14
Group ranking CA = MA > WS = DS (DS = MA)				
Speaking turns				
Mean	0.66	0.65	0.89	0.82
Standard deviation	0.19	0.21	0.14	0.23
Group ranking CA = MA > WS = DS				
Expressives				
Mean	22.48	14.98	13.31	16.36
Standard deviation	9.78	8.32	5.43	6.18
Group ranking WS = MA > CA = DS				
Unsatisfied directives				
Mean	39.93	29.82	20.57	15.73
Standard deviation	12.62	6.90	7.67	4.63
Group ranking WS > DS = CA = MA				

WS = children and adolescents with Williams syndrome

DS = children and adolescents with Down's syndrome

CA = typical children of the same chronological age

MA = typical children of the same mental age