



Atypical verbal communication pattern according to others' attention in children with Williams syndrome

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ABSTRACT

Children with Williams syndrome (WS) have been reported to often face problems in daily communication and to have deficits in their pragmatic language abilities. To test this hypothesis, we examined whether children with WS could modify their verbal communication according to others' attention in order to share what they did. The children with WS and typically developing (TD) children were asked to accomplish tasks as quickly as possible while the experimenter was attending to or not attending to them during and after their accomplishment. The results showed that although TD children verbalized more when they were not attended to than attended to, children with WS verbalized more when they were attended to than not attended to. The results indicate that children with WS may have deficits in attention-sharing communication, suggesting a part of their pragmatic abilities is impaired.

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1. Introduction

Williams syndrome (WS) is a rare genetic neurodevelopmental disorder. It is caused by a microdeletion of chromosome 7q11.23 (Ewart et al., 1993). The phenotype of WS has been characterized by relatively strong language abilities and weak visuospatial cognition (Bellugi, Lichtenberger, Jones, Lai, & St. George, 2000; Mervis, Morris, Bertrand, & Robinson, 1999; Udwin, Yule, & Martin, 1987). However, recent studies showed that language abilities of individuals with WS are not as advanced as previously claimed. For example, their receptive grammatical ability is no better than their overall mental age (see Brock, 2007, for a review).

Furthermore, some clinical research reported that children with WS faced a lot of problems in daily communication. Udwin et al. (1987) asked the parents and/or teachers of children with WS about their children's difficulties. They reported that the problems faced by their children included chattering incessantly at a superficial level and speaking in an old-fashioned manner. Moreover, Laws and Bishop (2004) used communication checklists for parents, and revealed that children with WS showed difficulties especially in the inappropriate initiation of conversation and the use of stereotyped conversation. Philofsky, Fidler, and Hepburn (2007) used the same checklists for parents, and compared the outcome of children with WS with that of children with Autism Spectrum Disorders, who are known to have deficits in social and communicative skills. They found that the extent of difficulties in the inappropriate initiation of conversation and the use of context was not different between children with WS and those with Autism Spectrum Disorders. These reports implied that children with WS have deficits in pragmatic language abilities. Pragmatic abilities are broadly defined as the abilities to use

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language in a social context for the purpose of communication. Specifically, pragmatic abilities include turn-taking, politeness (to speak in a polite manner), communicating according to others' state (communicating while taking account of others' attention, belief, etc.) and so on (Clark, 2004).

While clinical investigations have reported converging evidence in the pragmatic deficits in WS, previous studies using experiments or semi-structured conversations on this topic have presented rather mixed evidence. Several studies demonstrated that individuals with WS performed relatively well in communication tasks. Jones et al. (2000) conducted a semi-structured interview with adolescents and adults with WS. Participants were questioned about their family, activities, and interests, and then received follow-up questions in line with natural conversational flow. They revealed that individuals with WS used expressions—such as descriptions of affective states and emphatic markers—to elaborate their stories more frequently than those with Down syndrome and developmental age-matched typically developing (TD) controls. In the same paper, Jones et al. (2000) investigated narratives of children with WS. Children were asked to tell a story to the experimenter after seeing a wordless picture book. They revealed that children with WS used exclamatory phrases such as sound effects or character speech, which seemed to function to renew and maintain audience attention, more frequently than chronological age-matched TD children. Furthermore, Reilly, Losh, Bellugi, and Wulfeck (2004) found the same result in children with WS in a broader age range, as compared with children with specific language impairment.

In contrast, Stojanovik (2006) showed that children with WS had a deficit on another communication task although there are far fewer reports of deficits than of good expressive language skills. In her study, children were shown some photographs representing everyday scenes and were encouraged to talk about their own experiences related to the topic. The adult partner sometimes asked prepared questions when it was felt that the conversation was not progressing. Stojanovik found that children with WS added new information less frequently in their replies although they uttered more words than those with specific language impairment.

These two lines of studies may seem contradictory because they represent both strengths and weaknesses in the pragmatic abilities of individuals with WS. However, the apparently contrasting evidence might shed light on the unique features of their pragmatic abilities. As the previous studies revealed, although individuals with WS demonstrated good performance by using elaborate expressions in describing stories, they had difficulty in making relevant replies in reciprocal conversations. Individuals with WS might have relatively good skills to express their meaning by using elaborate language (e.g. narrative) but might have deficits in the ability to use them according to their listeners' state (e.g. relevant replies). As suggested by pragmatic theories, human communication is typically supposed to be relevant for both the speaker and listener, and the speaker is often required to talk while taking account of the situation of the listener (Grice, 1975; Sperber & Wilson, 1995). The previous clinical investigations might detect such deficits in individuals with WS because daily communication, which includes communication breakdowns, necessity of clarification, etc., often requires them to communicate according to others' state. Individuals with WS might have specific difficulty in communicating according to others' state. This study focused on this aspect of the pragmatic abilities of individuals with WS.

Previous studies reported that TD children can use pragmatic communication skills early in development (Ferrier, Dunham, & Dunham, 2000; O'Neill, 1996; Shwe & Markman, 1997). For example, O'Neill (1996) showed that 2-year-olds named a toy and its location more frequently when their parent did not know of the location than when she or he did in situations where they sought their parent's help in retrieving the toy. In addition, previous studies reported that most children with WS began to produce language before they began to point in their communicative development, and this developmental pattern was opposite to the pattern shown by other groups of children, such as TD children and children with Down syndrome (Laing et al., 2002; Mervis & Bertrand, 1997). Pointing is thought to have several prototypical pragmatic functions, which are found in human conversation (Bates, Camaioni, & Volterra, 1975; Tomasello, Carpenter, & Liszkowski, 2007). The relatively late emergence of pointing for individuals with WS supports the view that their difficulty in pragmatic abilities might appear during early verbal communication.

In the present study, we investigated one of the pragmatic abilities, that is, communicating according to others' state, which was assumed to be impaired in children with WS on the basis of the previous studies. Specifically, we examined whether children with WS in comparison to TD children could modify their communication according to when they were attended to or not attended to in a situation where they needed to share something with the experimenter.

We expected that TD children would think that the experimenter did not know when and how they achieved the tasks when they were not attended to whereas they would think that he knew it to some extent when they were attended to. Therefore, we predicted that TD children would verbalize more when they were not attended to than attended to in order to share what they did with the experimenter. In contrast, children with WS were hypothesized as having difficulty in communicating according to the experimenter's state. Thus, we predicted that, unlike TD children, children with WS would not verbalize more when they were not attended to than attended to. In other words, we predicted that they would not verbalize appropriately according to the experimenter's attention.

2. Method

2.1. Participants

Diagnosis of all the children with WS was made by a clinical geneticist and confirmed by the fluorescence in situ hybridization (FISH) test for the deletion of the elastin gene. TD children were recruited using a database of parents who had

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