ELSEVIER

Journal of Neurolinguistics 18 (2005) 479–501

Journal of NEUROLINGUISTICS

www.elsevier.com/locate/jneuroling

Distinct patterns of language impairment in Down's syndrome and Williams syndrome: The case of syntactic chains

Melanie Ring, Harald Clahsen*

Department of Linguistics, University of Essex, Colchester C04 3SQ, UK

Received 28 June 2004; received in revised form 7 June 2005; accepted 13 June 2005

Abstract

This study presents experimental results on syntactic binding of reflexive and non-reflexive pronouns and on the comprehension of active and passive sentences in eight adolescents with Down's Syndrome (DS), and 10 with Williams Syndrome (WS). We propose a syntactic account of the difficulties of people with DS in these domains. We also compare our results on DS and WS with previous findings from studies using the same experimental tasks on adolescents with Specific Language Impairment (SLI). Distinct patterns of linguistic impairment were found for these developmental disorders indicating that at least in these syntactic domains different genetic etiologies are associated with different specifically linguistic patterns of impairment.

Keywords: Down's syndrome; Williams syndrome; Passivization; Syntactic binding; Specific Language Impairment

1. Introduction

The study of language disorders faces the question of whether people with different etiologies show common or distinct patterns of impairment. In the domain of neurodevelopmental disorders, the issue is whether children with different genetic impairments exhibit similar or different patterns of linguistic strengths or weaknesses. Comparative studies of language impairments with different genetic etiologies, for example

* Corresponding author. Tel.: +44 1206 87 2228; fax: +44 1206 87 2198.
E-mail address: harald@essex.ac.uk (H. Clahsen).

0911-6044/$ - see front matter © 2005 Elsevier Ltd. All rights reserved.
doi:10.1016/j.jneuroling.2005.06.002

people with Down's Syndrome (DS), who have an extra copy of chromosome 21 (Smith, 1985) and people with Williams Syndrome (WS), who are affected by a microdeletion on the long arm of chromosome 7 at 7q11.23 (Ewart et al., 1993), should lead to linguistic profiles for each neurodevelopmental disorder, a prerequisite for further investigating how different parts of the genetic program affect particular aspects of language.

A related question concerns the nature of the language impairments seen in different neurodevelopmental disorders. As linguists, we specifically ask whether it is possible to explain language impairments in terms of selective deficits within the linguistic system itself. In a series of previous studies, we proposed a modular account for WS, adopting the view that the knowledge of language consists of two separate components, a lexicon of stored entries and a computational system of combinatorial operations to form larger linguistic expressions (e.g. Chomsky, 1995; Pinker, 1999). Investigating a range of linguistic phenomena and skills, among them the comprehension of passives and anaphoric pronouns (Clahsen & Almazan, 1998), past-tense inflection (Clahsen & Almazan, 1998; Clahsen, Ring, & Temple, 2004), noun plurals and compounding (Clahsen & Almazan, 2001), comparative adjective formation (Clahsen & Temple, 2003; Clahsen et al., 2004), receptive vocabulary skills and naming (Temple, Almazan, & Sherwood, 2002), and reading (Temple, 2003), we argued that the two core modules of language are dissociated in WS such that the computational (rule-based) system for language is not affected, at least not beyond a general developmental delay, while lexical representations and/or their access procedures are impaired. Thomas et al. (2001) and Thomas and Karmiloff-Smith (2005) criticized this account specifically with respect to the past tense arguing that Clahsen and Almazan's (1998) results on English past-tense formation could not be replicated in Thomas et al.'s (2001) larger sample of WS participants and that the account given of the WS deficit does not include a developmental dimension. In response, Clahsen and Temple (2003) offered a reanalysis of Thomas et al.'s (2001) data that remains compatible with the idea that words and rules are dissociated in WS, and Clahsen et al. (2004) presented data from further cases of WS that confirm the original finding of a selective (lexical) impairment with irregular inflection. Finally, we agree that the inclusion of a developmental dimension would certainly be desirable for any account of the language impairments of people with WS; a prerequisite for that, however, are detailed longitudinal studies of language development in children with WS, which are currently not available. In any case, the idea that the linguistic system of people with WS is selectively impaired does not preclude the study of development; see Temple and Clahsen (2002) for further discussion.

With respect to DS, previous studies have indicated that language abilities are relatively more impaired than other areas of cognition in this population (Clibbens, 2001; Fowler, Gelman, & Gleitman, 1994; Mervis & Bertrand, 1997; Miller, 1996; Tager-Flusberg, 1999), and that within the language system, morphosyntax is more impaired than other linguistic domains (see Fabretti, Pizzuto, Vicari, & Volterra, 1997; Miller, 1988; Schaner-Wolles, 2004). Several studies have reported asynchronous patterns of linguistic development in DS, e.g. enhanced levels of lexical skill relative to reduced levels of morphosyntax (Chapman, Schwarz, & Kay-Raining Bird, 1991; Kernan & Sabsay, 1996; Miller, 1988; Vicari, Caselli, & Tonucci, 2000, among others). Finally, there are studies of DS that discovered patterns of morphosyntactic skill that are qualitatively different from