Using a linguistic savant’s learning of British Sign Language to explore linguistic theory

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Christopher is a linguistic savant. Despite his disabilities, which mean that everyday tasks are burdensome chores, Christopher can read, write, speak, understand and translate more than twenty languages. His drawing ability indicates a severely low IQ of between 40 and 60, yet his English language ability indicates a superior IQ in excess of 120. In virtually all of Christopher’s languages his comprehension abilities exceed his production abilities, his ability to learn complex morphology exceeds his ability to learn syntactic generalizations that concern resetting parameters, and he has difficulty using pragmatic knowledge in learning languages (Smith, Tsimpli, & Ouhalla 1993; Smith & Tsimpli 1995). The generalizations concerning his language skills and the extensive battery of tests demonstrating Christopher’s difficulties with memory and visuo-spatial tasks set the stage for a study which sought to teach Christopher British Sign Language (BSL) (Smith et al 2010).

The perspective taken is current generative theory (Chomsky 1981, 1995, 2002, 2009) and a quasi-modular theory of cognition (Tsimpli & Smith 1998). Our general claim is that Christopher has an intact language faculty, but some serious impairments in other cognitive components, such as visual cognition, memory, and pragmatics, along with a lack of the cultural encyclopedic knowledge that most learners bring to the language learning task.

Christopher’s learning experience was paralleled by a group of students with a high aptitude for language learning, in order to determine if Christopher’s pattern of learning BSL resembled that of the comparator group. Instruction consisted of a limited number of contact hours—12 hours of lessons plus 12 more hours of casual conversations. We focussed primarily on 4 areas of BSL grammar: iconic vs. non-iconic signs, classifiers, negation, and verb agreement, each chosen to address specific hypotheses.

Given that Christopher has difficulties with visual cognition, memory, and spatial relations, it was hypothesized that he would have difficulty learning iconic signs, and this was indeed confirmed. While the control group of second language learners acquired iconic signs more readily than non-iconic ones at this early stage of BSL instruction, Christopher acquired signs that were non-iconic more readily. And when asked to invent signs for common objects, he invented signs that seemed not to take advantage of visual iconicity.

Because Christopher has problems with spatial relations and iconicity, it was hypothesized that he would have difficulty learning classifiers, and indeed this was the case. He was able to comprehend classifier structures more adeptly than produce them, but even in comprehension, compared with the control group, his abilities were poor.

Also in the area of verb agreement and associated pronominal signs, his difficulties with spatial relations were predicted to present an obstacle. One of the main problems was that Christopher was unable to perform the mental rotation of signing space required to reproduce the correct verb agreement.

Christopher has been shown to be extremely adept with learning complex morphology, so it was hypothesized that simultaneous morphology that was not based in any way on spatial relations might be one area where Christopher would
excel. This turned out to be true for the use of the negative headshake. By the end of the instruction period, Christopher performed as well as the control group in the use of the negative headshake that was produced simultaneously with the verb as a negation marker, although this marker has clear gestural origins. However, he had more difficulty using negation when it was a lexical process. For example, in BSL, DON'T-KNOW, DON'T-LIKE, and DON'T-WANT are signs that have a different negative marker; i.e., a movement involving the twisting of the wrist outward from the place of articulation.

Christopher’s performance on gesture was very poor compared with his BSL abilities. For example, he scored very poorly on the Kimura test of non-representational gesture. Since Christopher’s difficulties with verb agreement seemed to stem from this rotation problem, but also included some areas where he performed fairly well (and certainly better than with classifiers), we conclude that verb agreement is not an extension of gesture, as some sign language researchers claim. His signing resembles that of Heather, a young Deaf woman with specific visuo-spatial impairments reminiscent of Williams Syndrome (Atkinson et al, 2002), who has severely impaired gesture contrasting with her signing ability. Both have language abilities in BSL well in advance of their visuo-spatial abilities and a disassociation within BSL grammar between devices that depend on grammatical processes involving space and those that do not. Using these data, we will argue for a clear distinction between gesture and sign.

References


