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Numerical and Spatial Abilities in a Language-Deprived Adolescent

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Abstract: We investigated the representational abilities of a 13-year-old child, deprived of most linguistic input from late infancy due to deafness, in a battery of tests designed to reveal the nature of numerical and geometrical abilities in the absence of a full linguistic system. Tests revealed widespread proficiency in basic numerical computations involving the use of both exact and approximate numerical representations. Tests of spatial and geometrical abilities revealed an interesting patchwork of uncanny strengths and severe, localized deficits. In particular, the child performed extremely well on navigation tasks involving geometrical or landmark information presented in isolation, but very poorly on otherwise similar tasks that required the combination of the two types of spatial information. Tests of number- and space-specific language revealed proficiency in the use of number words and deficits in the use of spatial terms. This case suggests language plays an important role in the combination of mental representations.