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Authors

Jensen, Clint A.

Rogers, Timothy T

Travers, Brittany G.

et al.

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Logical language and the development of reasoning by the disjunctive syllogism

Myrto Grigoroglou

University of Toronto, Toronto, Ontario, Canada

Salima Hackeek

University of Toronto, Toronto, Ontario, Canada

Patricia Ganea

University of Toronto, Toronto, Ontario, Canada

Abstract

Whether logical inference is available without language is highly debated. One such inference is the disjunctive syllogism (A Or B, Not A, Therefore B). Evidence from non-linguistic search tasks suggests that that the syllogism may be unavailable before age 3 (Mody & Carey, 2016). However, in a replication of the same task using language (i.e., verbal negation), even 2.5-year-olds succeeded (Grigoroglou, et al., 2019). Here we explore the role of language in children's logical reasoning. 2.5-, 3- and 4-year-olds performed a non-linguistic search task, after a short training in reasoning by exclusion. Half of the children received linguistic training (e.g., heard "there is no coin in X cup"); half received non-linguistic training (i.e., saw that one location was empty). Results show that 2.5-year-olds who received linguistic training succeeded in disjunctive syllogism but those who received non-linguistic training failed. We conclude that the presence of verbal negation facilitated logical reasoning.