

# Assessing the Influence of Item Characteristics on Strategy Use in Transitive Reasoning Tasks using Latent Class Analysis

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**Keywords:** cognitive strategies, transitive reasoning, latent class analysis.

## Abstract

In a transitive reasoning task an unknown relationship (for example  $Y_A > Y_C$ , has to be inferred from two or more known relationships (for example  $Y_A > Y_B$  and  $Y_B > Y_C$ ). Transitive reasoning tasks can differ on a number of aspects, for example, the way the premise pairs are presented (simultaneously, successively); the format of the relationships (for example  $Y_A > Y_B > Y_C$ ;  $Y_A = Y_B = Y_C = Y_D$  or  $Y_A = Y_B > Y_C = Y_D$ ); or the type of content that is used (for example sticks that differ in *length*, or animals that differ in *age*). Cognitive theories disagree about the number of abilities that are involved when solving different kinds of transitive reasoning tasks. With the help of IRT methods, it was concluded that one underlying ability could explain the response patterns of children on a set of 16 transitive reasoning items containing different item characteristics.

It appeared, however, that different kind of transitive and non-transitive strategies were used to solve the transitive reasoning items. In this study the influence of item characteristics on the strategy use was investigated for 615 children from grade two through grade six. Latent class analysis was used to test the hypothesis that groups of children could be distinguished that differed with respect to the kind of strategies that were used and with respect to the influence that item characteristics had on the strategy use.