Any Way the Wind Blows: Children's Inferences about Force Dynamics Events

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Force and Motion

Force dynamics refers to patterns of forces in the world that underlie verb categories such as *help* or *prevent* (Wolff, 2007)


To learn these verbs, children must learn to bind cause(s) to effect in motion events

Infants in the first year bind cause to effect in single force collisions based on the spatio-temporal contiguity between two objects
(George, Göksun, Hirsh-Pasek, & Golinkoff, in preparation)
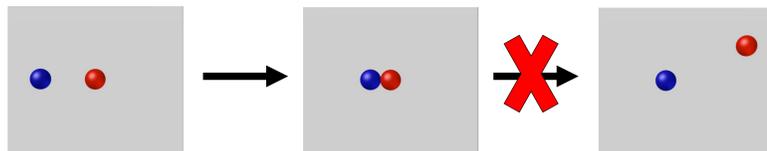
Not until 5 can children predict trajectories of two-force events, and success is largely limited to the single dimension orientations prototypical of linguistic categories
(Göksun, George, Hirsh-Pasek, & Golinkoff, in press)
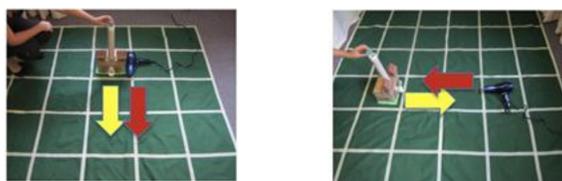
However, language also relies on *inference*: a result is observed and the cause(s) are identified among possibilities in the world

Can 6-year-olds infer the causes of motion in events that mimic linguistic categories?

Methods

Participants
Twenty-eight 5- to 6-year olds
(11 male; M = 71.48 mos)

Task Types

Identification

Shown where the ball travels, identify the fan(s) responsible for the result

Intervention

Given a fan in a fixed position, place a second fan to achieve a desired result, indicated by the red square
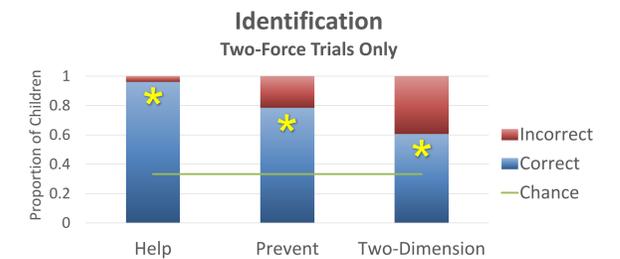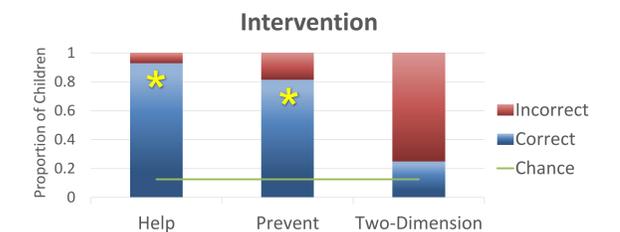
Trial Types

Help   *Prevent*   *Two-Dimension*

Results

Identification Trials
Above chance for all trial types, *ps*<.01
Two-dimension trials significantly worse than help trials, *p*<.01

Intervention Trials
Only help and prevent trials above chance, *ps*<.001
Two-dimension trials significantly worse than help and prevent trials, *ps*<.01

Discussion

Overall, children's inferences mirror their predictions: children perform better in events in which forces are arranged in a single dimension

Children can successfully *identify* when two forces are responsible for a result, regardless of the orientations

Differential performance may reflect deeper relation between the events languages encode and our reasoning about them