Spatial Language during Block Play

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Spatial skills are a crucial component of human intellect. How do they develop? One important answer may lie in the relationship between human spatial cognition and the symbol systems we use to describe spatial concepts. In particular, the representational system afforded by spatial language may provide an accessible introduction to spatial concepts. By directing children's attention to spatially-relevant aspects of their environment, spatial language highlights patterns that might otherwise go unnoticed, for example, how one block is situated *under* another in a tower. This type of language offers a categorical label that emphasizes qualitative divisions in what is otherwise continuous space. As such, spatial language might support spatial reasoning ability.

But when are spatial words used, and in what contexts? Block play is one common spatial activity in which spatial language might naturally occur. Blocks have been frequently mentioned as contributing to the development of spatial skills (Brosnan, 1998; Caldera et al., 1999; Ginsburg, 2007; Ness & Farenga, 2007). During the second and third years of life, children pile blocks on top of one another (Shutts, Ornkloo, von Hofsten, Keen, & Spelke, 2009). As their play becomes more sophisticated, children pay special attention to the colors, shapes, and sizes of blocks. They may also compare the relative sizes of the towers they create (Leeb-Lundberg, 1996). Reifel (1984) suggests that blocks allow children to play directly with spatial concepts, which in turn could assist their developing representations of spatial relationships between objects in the physical world (e.g., into, out, together, on top, beside, etc.).

The current study

Thirty-six children and their parents participated in the in-lab portion of this study. A set of MegaBloks containing various sized blocks, as well as vehicles and figures, was used. The study contained two 10-min phases. Participants were randomly assigned to one of three conditions in Phase 1. In the *free play* condition, parents and children were told to play with the set of blocks as they would at home. In the *guided play* condition, the parent and child were given five numbered photographs depicting the steps to build either a garage or a helipad. In the preassembled play condition, a glued-together model was given to the dyad, as well as the vehicles and figures.

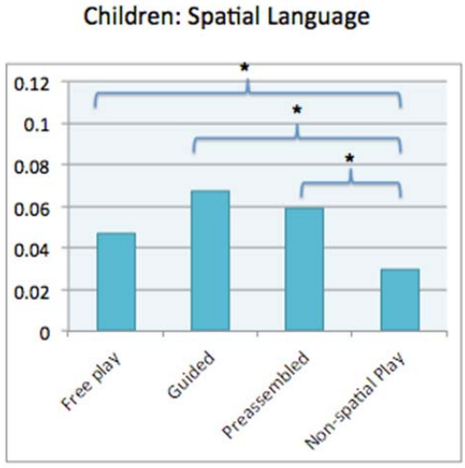
In addition to the in-lab data, 31 transcripts from the CHILDES database were selected that fit they following criteria: depiction a non-spatial play activity between a 3- 6-year-old child and a single caregiver. The non-spatial play activities included play with puppets, drawing, playing store, dressing up, playing ‘‘zoo’’ with animal figurines, pretending to talk on a telephone, playing “tea party,” and playing with pretend food.

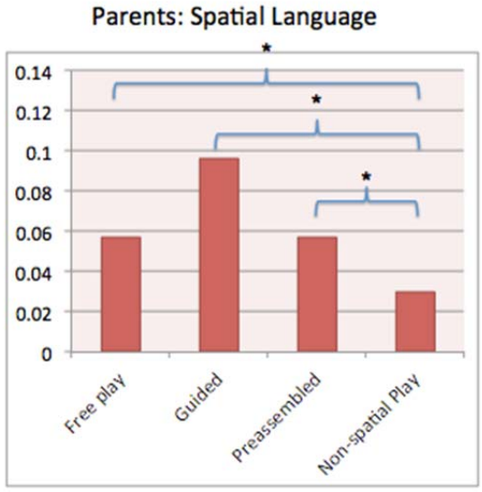
Analyses

Transcripts of both the in-lab study and those from the CHILDES database were analyzed for child and parental spatial language using the spatial categories of the University of Chicago spatial language coding system (Cannon, Levine, & Huttenlocher, 2007). Specifically, coders identified terms and phrases that described the following spatial categories: (1) spatial locations (up, down), (2) deictic terms (here, there), (3) dimension (long, tall), (4) spatial features or properties (curvy, straight), (5) shapes (rectangle, square), and (6) spatial orientations or transformations (‘‘turn it around,’’ ‘‘the man is facing the block’’).

Results

Analyses of the spatial language demonstrated by parents and children revealed significant differences between the free play, preassembled, and guided play conditions. Parents in the guided play condition demonstrated significantly more spatial language than parents in the free play condition and parents in the preassembled condition. No significant differences were found between parents in the free play and preassembled play condition. Similarly, children in the guided play condition demonstrated significantly more spatial language than children in the free play condition. Differences were also found between the spatial language proportions demonstrated in the block play conditions and the proportions calculated from the set of CHILDES transcripts. In all three block play contexts, parents and children used significantly more spatial language than the non-spatial play activities depicted in the CHILDES transcripts.





Implications

These results lead us to conclude that introducing blocks to a play context is likely to elicit conversation containing a host of spatial vocabulary above and beyond what is used in other types of play. The fact that the guided play condition elicits more spatial language suggests that experimental and educational interventions may follow such a model to increase the frequency of spatial language children hear and come to use on their own. These finding bear direct relevance to implementation in classrooms, in which a teacher may use goal-directed block play as a means of introducing and acting out spatial concepts and relationships. Future research will further elucidate the way in which block play may be utilized as a mode that fuses together playful learning and spatial education.

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