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# **Cardinal Direction Knowledge in 6-12-year-old Children**

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## **Abstract**

Cardinal directions refer to the four main points of direction in geographical space: north, south, east, and west. Efficient navigation requires some basic knowledge about cardinal directions. We evaluated developmental changes in cardinal direction knowledge in real space. Tested in an unfamiliar indoor environment with a window view, 94 children aged 6-12 years old were asked to point to North and then point to East. We proposed 7 developmental stages based on knowing the horizontal plane of cardinal directions, the inter-relationships between them, and how to identify north using reference frames. Our classification scheme classified all participants and was sensitive to age differences. Our results suggested that identifying north was more difficult than knowing the inter-relationships. Many children were not able to use an allocentric reference frame effectively. Overall, our study demonstrates the utility of our classification scheme and the importance of evaluating cardinal direction knowledge development in children.