Hand Preference In Relation to Hand Skill at 2 Years

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Development of Handedness

- Consistent hand preference for acquiring objects emerges by 10-11 months of age in roughly 50% of infants[1].
- However, 11-to-14-month olds show no clear differences in hand skill between the preferred and non-preferred hand[2].
- By 24 months of age, nearly 100% of children exhibit a consistent hand preference for role-differentiated bimanual manipulation (RDBM)[3].
- Research has suggested that adults increase the use of the preferred hand when skill is required, such as in complex manipulation tasks[4].

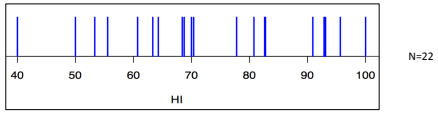
How are hand preference and skill related at 2 years of age, a timepoint when most children exhibit a consistent hand use pattern?

RDBM Task – Hand Preference Assessment

Method:

- 22 participants aged 23 to 25 months.
- Given 29 role-differentiated bimanual manipulation (RDBM) tasks to complete in which the object must be steadied with one hand and manipulated with the other hand (e.g. hold pouch, remove toy from inside).[4]
- A Handedness Index (HI) was calculated for each child using the formula *HI = # Right hand responses/Total*

Results:



Hand preference distribution

- 20 children had a right hand preference for RDBM.
- One child had a left hand preference and 1 child had no hand preference.

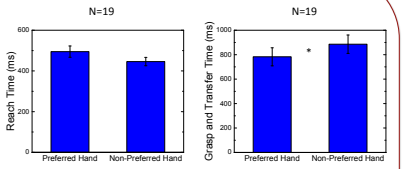
Bee Task – Fine Motor Assessment

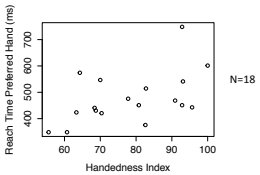
Method:

- A beehive toy with a circular aperture on the top is placed at child's midline, and a spherical "bee" is placed in front of the child's left or right hand.
- The child is asked to put the bee into the beehive.
- Reach time to the bee, time to grasp, and time to transfer the bee to the hole were coded.

Results:

- Children had a marginally longer reach time with preferred hand.
- During grasp and transfer, reach times were significantly shorter with the preferred hand.
- HI was significantly correlated with reach time for the preferred hand (r= .50, p= .03).
- As participants became more right dominant, their reach time with their right hand was longer.





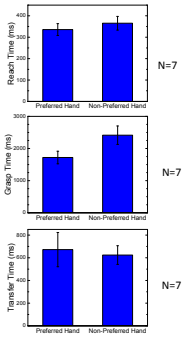
Cheerio Task – Fine Motor Assessment

Method:

- A cup with a cheerio is placed in front of child, either in line with the left or right hand, or at midline.
- Reach time to the cup, time to grasp, and time to transfer the cheerio to the mouth were coded.

Results:

- Only 7 participants contributed sufficient data for analysis (multiple reaches with each hand).
- No significant differences in time between hands was found on any stage of the action.
- Large differences in grasp time with much shorter grasps with the preferred hand were observed, but not significant, possibly due to insufficient power.
- HI did not predict whether child was more likely to reach with left or right hand to cup placed at midline.



Conclusions

By 2 years, a relationship emerges between hand preference and skill.

- Two-year-olds showed longer reach times to an object with their preferred hand, which may be indicative of more care and precision.
- This relationship followed a linear trajectory, in that stronger right-lateralization lead to longer reach times.
- Two-year-olds fitted a ball into the aperture more quickly with their preferred hand, showing finer coordination with that hand.
- Results also support a relation between right hand use and tasks requiring precision.
- Future work should examine right hand skill in additional left-handers and those with no clear hand preference.

References

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