

Age and gender effects on movement imagery in children

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Introduction

- Movement imagery (MI) is a widely used experimental paradigm for the study of motor control and action planning in adults. (Gabbard, 2009). It is the mental simulation of a given action, without actually executing the movement (Decety, 1995).
- A measure of imagery ability currently exists for adults but not for children. The MIQ-R is the most used movement imagery ability measure. It distinguishes between visual and kinesthetic imagery perspectives (Hall & Martin, 1997).
- The most recent revision of the questionnaire is the MIQ-3. It has further divided visual imagery into external visual and internal visual perspectives. (Williams et al., 2011).
- The movement imagery questionnaire for children (MIQ-C) was recently created by Martini, Ste-Marie and Cumming. It is a modified version of the MIQ-3. Pictures and simplified language were used to ensure understanding of each concept.
- Although we know that MI begins to be used by children around the age of 7 (Molina et al., 2008), very little is known about the development of MI in children.

Purpose

The purpose of this project was to examine the development of movement imagery in children across three age phases using the MIQ-C.

Methods

- The sample included 153 English speaking children between the ages of 7 and 12 (72 males and 81 females).
- MIQ-C: This questionnaire includes four movements that are imaged from the three imagery perspectives (internal visual, external visual or kinesthetic), thus comprising 12 items. The children are first described the movement, asked to perform it and then upon returning to the starting position, to imagine the movement according to one of the perspectives.
- Data was analyzed in a 3 (Age: 7-8, 9-10, 11-12) x 2 (Gender: Male, Female) x 3 (Modality: IVI, EVI, KI) ANOVA with repeated measures on the last factor.

References

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Results

- Male participants had significantly higher mean test scores overall than female participants, regardless of the age group or the imagery perspective ($F(1, 147)=3.92, p<.05$) (see Figure 1).
- As a whole, the group had the highest mean scores in the interval visual perspective, followed by the external visual perspective and the lowest mean scores in the kinesthetic perspective ($F(2, 294)=29.67, p<.05$) (see Figure 2).
- There was no significant main effect for age although data shows a trend toward an increase in mean testing score from the 7-8 years age group to the 9-10 years age group, and to the 11-12 years age group in male participants.
- In female participants there was an increase in mean testing scores from 7-8 years to 9-10 years, followed by a decrease in mean testing scores at 11-12 years (see Figure 3).
- There was no significant interaction between age and gender.

Conclusions

- Participants could more easily image movements in the visual perspectives than in the kinesthetic perspective. These findings are consistent with the findings of Caeyenberghs et al. (2009).
- Children more easily imaged movements from an external visual perspective than from an internal visual perspective. This suggests that children may benefit from the use of visual aids in a 3rd person perspective as opposed to other perspectives when learning new motor tasks.
- Kinesthetic ability was the lowest and so it may also be beneficial to encourage the practice of kinesthetic imagery more often in children, as imagery training is known to increase imagery ability.
- In both genders there was a trend towards an increase in imagery ability from the 7-8 age group to the 9-10 age group. This suggests that the majority of movement imagery development occurs during these years.
- There was also a trend towards a decrease in imagery ability in females at the age of 11-12 in all perspectives. We are uncertain as to what drives this decrease and more investigation is needed.
- Gender may also play a role in the development of movement imagery in children. This differs from what has been found in past research with adults (Monsma et al., 2009). Differences between the genders at this age may be due to differing sport experiences, a factor still to be examined as increasing sport participation may increase the use of movement imagery. Further research would help to clarify this trend as well.

