

# The Relationship Between Digit Ratio and Interhemispheric Transfer Time



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## Introduction

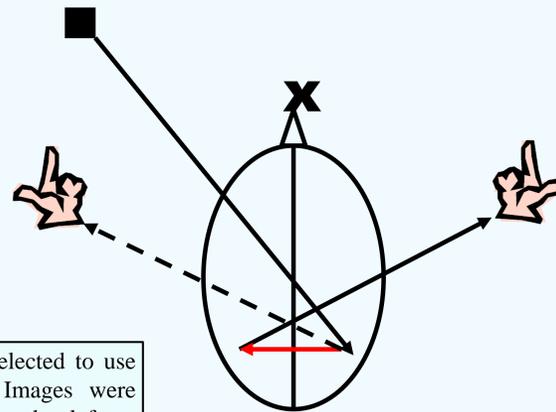
The research investigated whether prenatal exposure to androgens (as assessed by digit ratio, McIntyre, 2006) would be related to how quickly information is transferred between the hemispheres of the brain. Prior research has shown that males are exposed to greater amounts of testosterone prenatally than females (Pfannkuche, 2009) and that there are numerous sex differences in the sizes of different parts of the brain. For example, the corpus callosum is a wide, flat bundle of neural fibers that connects the left and right cerebral hemispheres and facilitates interhemispheric communication. (Chura, 2010). Several differences in the cytoarchitecture of the corpus callosum have been found (Dubb, 2003). In the present study, we assessed prenatal exposure to androgens using measurements of digit ratio (Manning et al, 1998) and assessed interhemispheric transfer time using Savage and Thomas' (1993) interhemispheric transfer manual reaction time task.

## Method

**Participants:** The participants tested were 31 students (13 men and 18 women) enrolled in courses at Oklahoma State University.

**Materials and Procedure:** Participants completed the IHTT task (Savage & Thomas, 1993). Later, the lengths of their fingers on each hand were measured using a digital caliper.

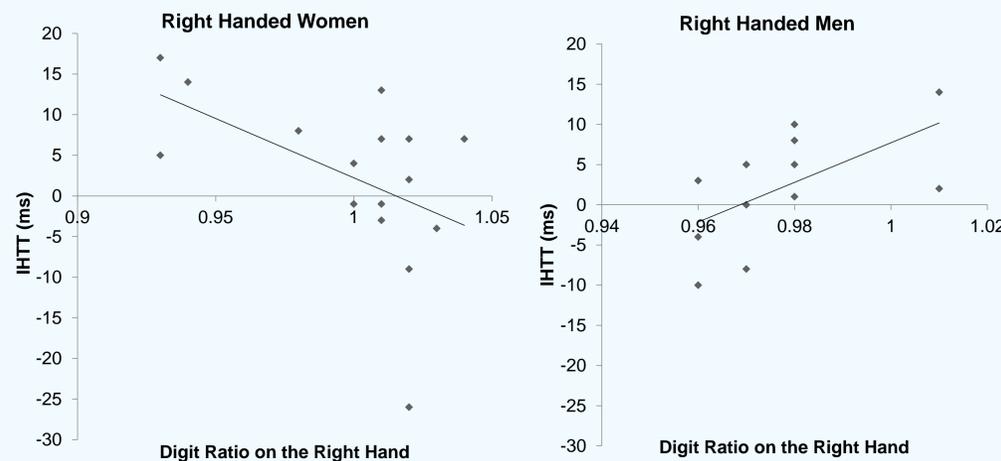
## The IHTT TASK



Individuals were selected to use their right hand. Images were displayed on either the left or right side of the screen. Then response time was measured.

## Results

According to the data shown, The IHTT is related to digit ratio on the right hand for both men and women, but in opposite directions. For women, smaller digit ratio on the right hand (which indicates greater androgen exposure prenatally) is related to longer IHTT ( $r=-.496, p=.05$ ). For men, smaller digit ratio on the right hand is related to shorter IHTT ( $r=+.659, p=.03$ ). These results are displayed in the graph below.



## Results cont' d

For women, the time taken to transfer information from the right hemisphere to the left was inversely related to the time taken to transfer information from the left to the right ( $r= -.615, p =.03$ ). For men, smaller digit ratio on the left hand was related to taking more time to transfer information from the left hemisphere to the right hemisphere ( $r= -.655, p =.03$ ). Overall, IHTT did not differ significantly for men and women. Digit ratio on the right hand was smaller for men than for women,  $F(1, 25)=(3.90, p =.06)$ .

## Conclusion

The results supported the hypothesis that digit ratio would be related to IHTT. They further indicated that the relationship differed for men and women. Prenatal exposure to androgen appears to slow IHTT for women but facilitate it for men. The relationship between digit ratio and IHTT has future implications that digit ratio may be an external physiological indicator of other cognitive processes, such as learning ability.

## References

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