

# Measuring handedness in adults: A comparison of two questionnaires

## Background and Aims

- About 85% of adults are right handed.<sup>1-2</sup>
- The Edinburgh Handedness Inventory (EHI) is the most widely used adult handedness questionnaire.<sup>3</sup>
- However, the EHI mixes different manual skill types and has insufficient actions to statistically determine handedness, potentially masking individual differences in handedness.
- Aims:** Create a new measure of handedness that 1) distinguishes unimanual and role-differentiated bimanual manipulation (RDBM) and 2) samples actions sufficiently to statistically determine handedness.

## Methods

- Participants:** FIU undergraduates ( $N = 218$ ; 191 female) enrolled in Psychology courses were recruited via FIU SONA Systems. Data was collected online using Qualtrics.
- Home Handedness Questionnaire (HHQ):** The HHQ includes 30 actions per skill type: unimanual actions using one hand (**Figure 1a**), and RDBM actions where one hand stabilizes an object for the other hand's manipulation (**Figure 1b**). Participants performed each action twice and self-reported which hand they used per action.
- Edinburgh Handedness Inventory (EHI):** Includes 10 activities that mix unimanual and RDBM actions.<sup>4</sup>
- Handedness Index (HI) for the HHQ:** HI scores were computed for HHQ-unimanual and HHQ-RDBM subscales using  $[HI = (R-L)/(R+L)]$ , where  $R$  = number of right hand actions and  $L$  = number of left hand actions. Hand preference was determined using binomial z-scores where  $z < -1.96$  = left preference,  $z > 1.96$  = right preference, and all other z-scores = no preference.
- Handedness Index (HI) for the EHI:**  $[HI = 100 \times (R-L)/(R+L)]$  was used in conjunction with cut-off scores:  $>0$  = right preference, scores  $<0$  = left preference, and  $0$  = no preference according to standard practice.
- Analyses:** One-sample  $t$ -tests were performed on HHQ-HI and EHI-HI scores to assess population-level bias for hand use.



Figure 1a: Unimanual action  
1b: RDBM action

## Results and Discussion

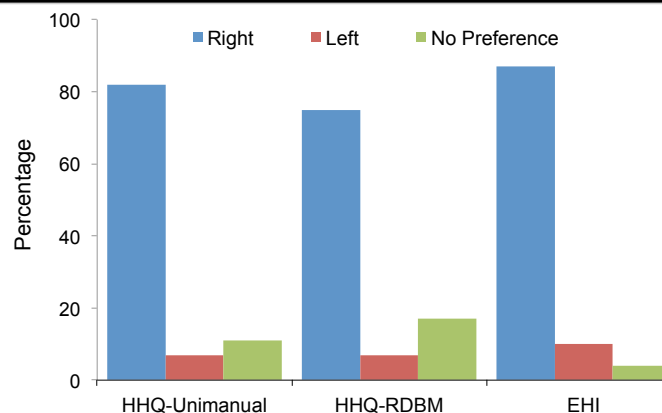


Figure 2. Hand preference percentages per measure

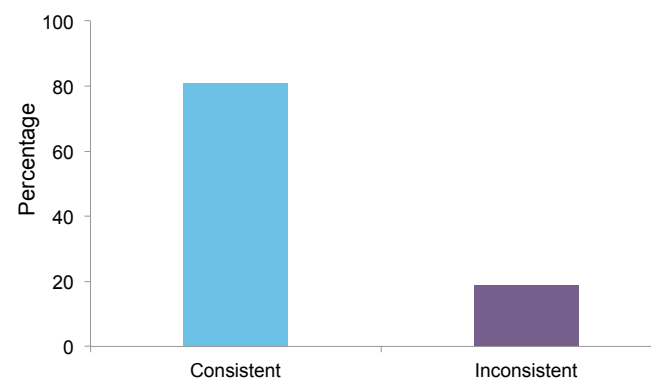


Figure 3. Percentage of consistent HHQ-unimanual and HHQ-RDBM hand preference

- A significant right-hand preference for HHQ-unimanual actions was found,  $t(217) = 20.13$ ,  $p < .001$ .
- There was also a significant right-hand preference for HHQ-RDBM,  $t(217) = 17.04$ ,  $p < .001$ .
- Comparably, a significant right-hand preference on the EHI was found,  $t(217) = 16.42$ ,  $p < .001$ .
- See **Figure 2** for break down of hand preference per measure.
- 71% of participants had a consistent right hand preference for unimanual and RDBM.
- 11% of participants had a consistency left hand preference for unimanual and RDBM.
- 6% of participants had no preference for unimanual and RDBM.
- See **Figure 3** for consistency in hand use across HHQ-unimanual and HHQ-RDBM.

## Take-Home Points:

- ✓ The HHQ was more sensitive to individuals with no preference compared to the EHI.
- ✓ A future direction will be to test the utility of the HHQ in preschool children.

## References and Acknowledgements

- <sup>1</sup> Annett, M (2002) ISBN 9781134950744  
<sup>2</sup> Nelson et al., (2017), DOI:10.1002/dev.21560  
<sup>3</sup> Veale, J, (2014), DOI: 10.1080/1357650X.2013.783045  
<sup>4</sup> Edlin et al., (2015), DOI: 10.1016/j.bandc.2015.01.003

We would like to thank the participants for their time.  
For more information about our studies visit [hands.fiu.edu](https://hands.fiu.edu)

✉ Correspondence: [vmora046@fiu.edu](mailto:vmora046@fiu.edu)