

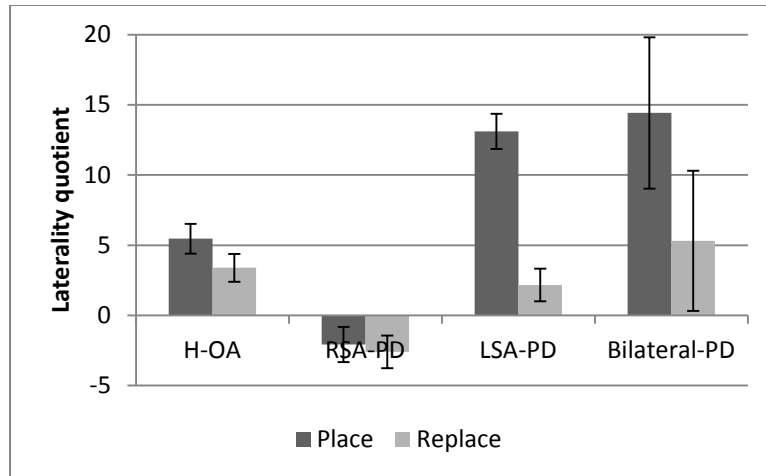
## Supplementary Material

A mixed analysis of variance test with repeated measures was used to assess laterality quotients computed from the GP task. The between subjects factor was group (healthy older adults: H-OAs; right-side affected PD: RSA-PD; left-side affected PD: LSA-PD; and Bilateral) and the within subjects factor was task (Place, Replace).

Analyses revealed a main effect of task ( $F(1, 251) = 9.390, p = .002, \eta^2 = .036$ ), such that there were greater laterality quotients (i.e., greater performance differences between the two hands) in place ( $M = 5.40, SD = 13.47$ ) compared to replace ( $M = 1.33, SD = 10.28$ ).

Additionally, a main effect of group ( $F(2, 251) = 22.344, p < .001, \eta^2 = .211$ ) revealed laterality quotients of all three groups differed, with the exception of Bilateral, which did not differ from H-OAs or LSA-PD. Both H-OA ( $M = 4.43, SD = 6.78$ ), LSA-PD ( $M = 7.64, SD = 13.33$ ) and Bilateral ( $M = 9.862, SD = 12.26$ ) groups had positive laterality quotients, indicative of superior right-hand performance; however, laterality quotients for the LSA-PD group were significantly greater than the H-OAs ( $p = .021$ ). The RSA-PD ( $M = -2.34, SD = 12.59$ ) had a negative laterality quotient, indicative of superior left-hand performance.

Finally, a significant interaction between group and task ( $F(2, 51) = 8.60, p < .001, \eta^2 = .093$ ; see Figure 1) revealed that the laterality quotients of H-OA, LSA-PD and Bilateral groups did not differ in the replace task; however, H-OA and LSA-PD group differed from the RSA-PD group in the place task. All three groups differed in the place task. When comparing the two tasks, RSA-PD, Bilateral and H-OA groups had similar laterality quotients in place and replace tasks; however, the LSA-PD group had significantly different laterality quotients.



**Supplementary material figure 1: Laterality quotients computed from the GP revealed distinct differences between RSA-PD and LSA-PD groups compared to H-OAs and Bilateral-PD. Error bars represent standard error.**