

## REPLY TO REPP'S (2012) COMMENTARY ON "THE EFFECTS OF STIMULUS RATE AND TAPPING RATE ON TAPPING PERFORMANCE"

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**T**HE MAIN ISSUE REPP RAISES IN HIS COMMENTARY (this issue) is related to the influence of ITI on the within-subject variability of tapping. He explains as follows, "Their [the regression lines from Figure 1 & 2 in his commentary] vertical separation, at a constant IOI, represents the effect of varying ITI. If there were no effect of ITI, the data points for different tapping modes should lie on the same regression line. It is clear that variability increased with ITI duration as well as with IOI duration..." Indeed, the regression analysis presented in our paper specifically tested this possibility. In our paper (Zendel, Ross, & Fujioka 2011), Figure 3c illustrated our data in a similar manner to these figures, and Table 2c presented the associated statistics (p. 75 and 74 respectively). In our data, the intercept of the 1:3 and 1:4 regression lines differed from the 1:1 regression line (at a hypothetical IOI of 0 ms). If lengthening the ITI had a systematically linear influence on tapping variability, the effect should be greater in the 1:4 condition compared to the 1:3 condition, because the ITI is longer in the 1:4 condition compared to the 1:3 condition (i.e., 3,120 vs. 2,340 ms). This was not the case. The difference in intercept between 1:1 and 1:3 tapping was actually greater than the difference between 1:1 and 1:4 tapping (unstandardized beta values for TCR(1:3) & TCR(1:4) in Table 2c-2, p. 74). In addition, slight differences (not statistically significant) in the slopes of these regression lines result in the difference between the 1:1 and 1:3/1:4 decreasing as IOI is increased. Finally, the overall regression models demonstrated that removing the

influence of ITI had a very small impact on the overall strength of the IOI model, where the reduction in *R*-square values was only 0.07 when ITI was removed (*R*-squared change in Table 2c-1, p. 74). On the other hand, when IOI was removed from the ITI model the *R*-square values decreased by 0.40 (*R*-squared change in Table 2d-1, p. 74). Accordingly, as discussed in our paper, the results indicated that the overall impact of ITI is much smaller than that of IOI on tapping variability, and that part of this effect could be related to a particular tap-click ratio (i.e., 1:3 tapping is more difficult), rather than a systematic linear effect of lengthening the ITI.

Repp is also concerned with our mean asynchrony data compared against his data in Repp (2003; Experiment 2) and Repp (2008; Experiment 1). He mentioned in his commentary that the data from Repp (2008) demonstrated a different pattern from the data presented in our paper. We would like to point out that our data are generally in line with his 2003 paper, consistent with the fact that our procedure was much more similar to Repp (2003), compared to Repp (2008) in terms of the number of taps measured and analyzed in each synchronization sequence (120, 38, and 7, respectively). Specifically, in Repp (2008) a total of ten taps were made during a short synchronization period (the last seven were analyzed), before participants continued tapping without sound. Thus, the synchronization sequence was much shorter in Repp (2008) compared to the other two studies, and we think that this likely contributed to the different pattern of results.

We would also like to clarify some confusion in his commentary on our paper. The second paragraph of Repp's commentary suggests that in our introduction we referred to Experiment 1 from Repp (2003), but in fact, we only referred to Experiment 2 from the same paper. In this experiment participants were asked to tap with tap click ratios of 1:1, 1:2, 1:3, and 1:4, thus the *n* in a 1:*n* tapping task was explicitly manipulated. We appreciate the opportunity to clarify the confusion.

Finally, we would like to thank Repp for clarification that Experiments 2 and 3 described in Repp (2007) did

not use tapping (p. 66, column 2, 2<sup>nd</sup> paragraph, line 9), and that “Tap-click-asynchrony” should have been “Tap-click ratio” (p. 72, column 1, 2<sup>nd</sup> paragraph, line 8).

Overall, we thank Repp for the detailed discussion and hope that our response helps clarify some of the concerns.

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