

The Human Brain Dynamics Lab
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Gonda Multidisciplinary
Brain Research Center

What is your Preferred Rhythm?

Investigation of motor and perceptual preferences

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Background

Is there such a thing as an Individual Preferred Rhythm?

SMT- Spontaneous Motor Tempo

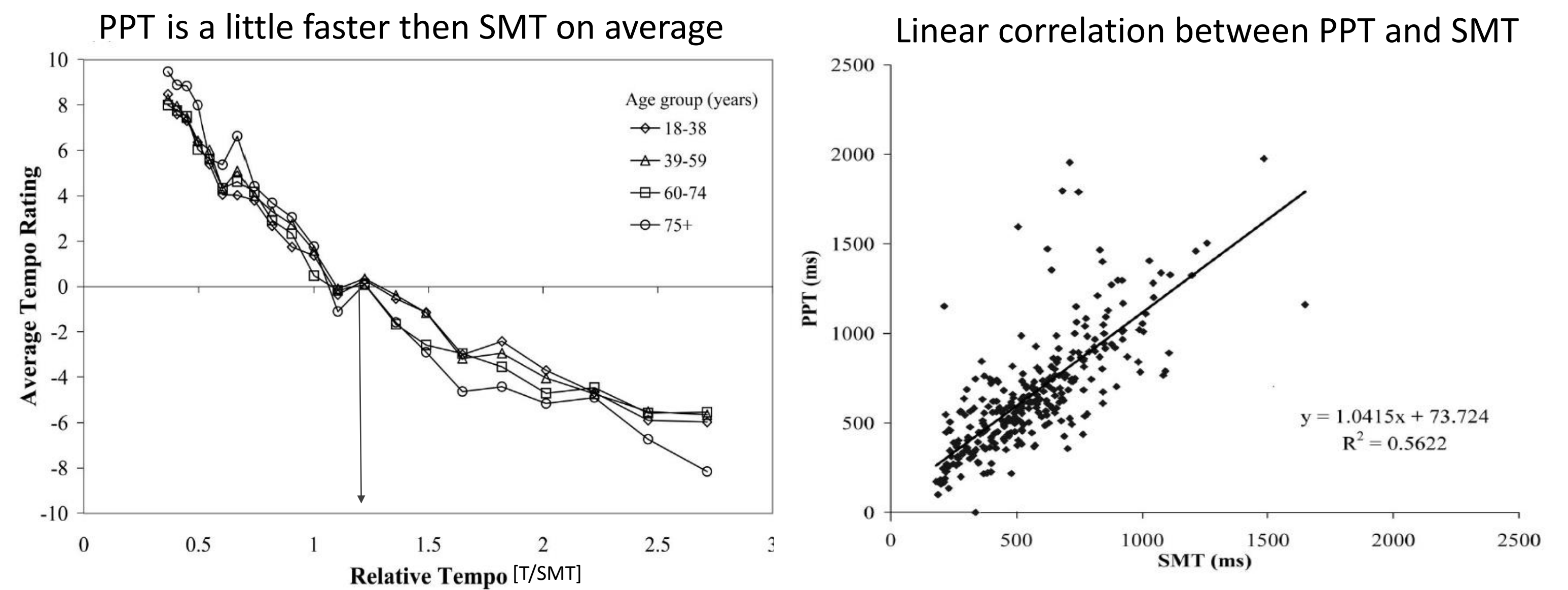
measured by tapping at a constant rate “at your most comfortable rate, not too slow and not too fast, but at a rhythm that feels just right”.

PPT- Preferred Perceptual Tempo

measured by grading auditory tones at different rates at a scale of -10 (very slow) to 10 (very fast), when 0 means “just right”.

McAuley et al. (2006)*, in a study of 305 subjects (ages 4-95), demonstrated an interesting link between SMT and a PPT.

*McAuley, J. D., Jones, M. R., Holub, S., Johnston, H. M., & Miller, N. S. (2006). The time of our lives: life span development of timing and event tracking. *Journal of Experimental Psychology*



Are group-level results sufficiently indicative of individual preferences?

Methodological criticism of McAuley et al.:

- PPT auditory rates were **centered around the SMT**. How does it influence the correlation found between them?
- Participants with **inconsistent SMT were removed** (10 to 25%). How consistent is the SMT when including all participants?

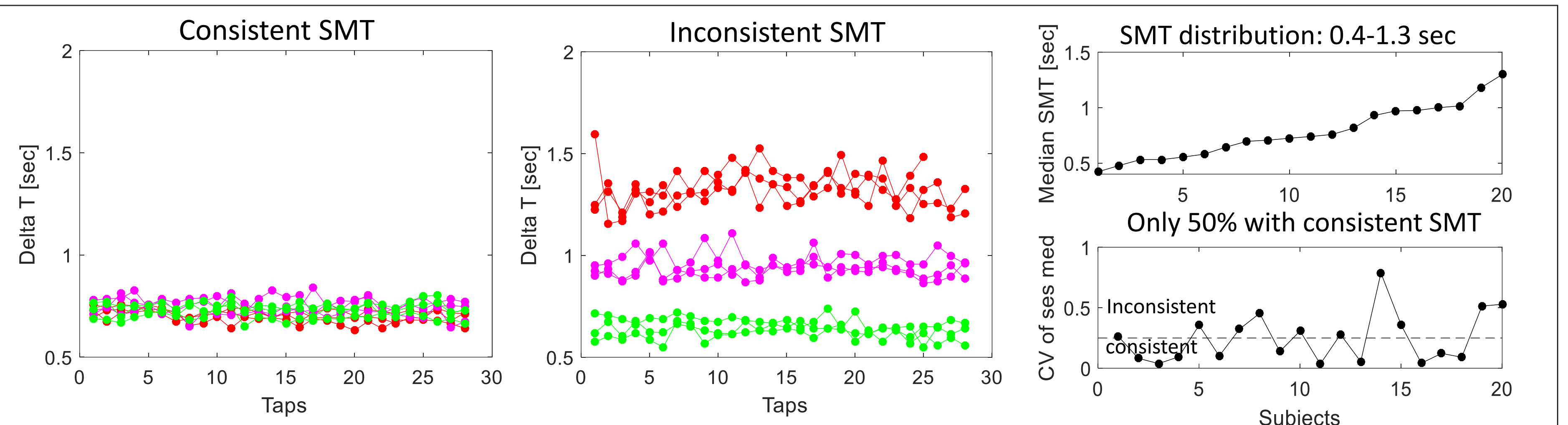
Zooming in on SMT & PPT

SMT: Is it consistent?

הקישו עם האצבע המורה בקצב **קבוע** שמרגיש לא מהיר ולא איטי מדי, אלא בדיוק **נח**. קצב שתוכלו להחזיק **לאורך זמן ללא מאמץ**.



הקישו באופן רציף עד שתקבלו סימן לעצור. לחצו על הכפתור על מנת להתחיל.

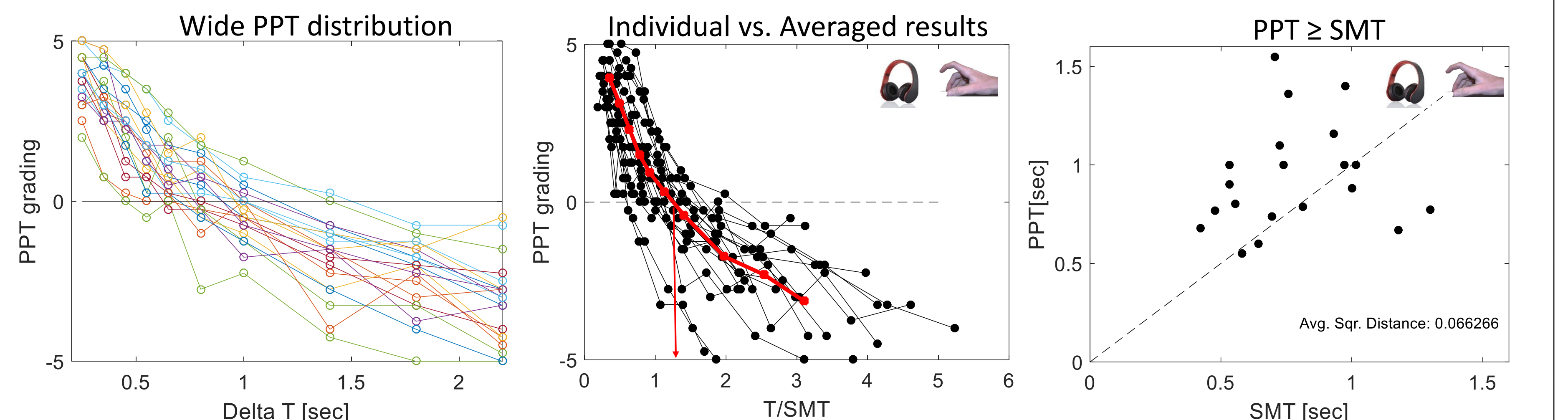
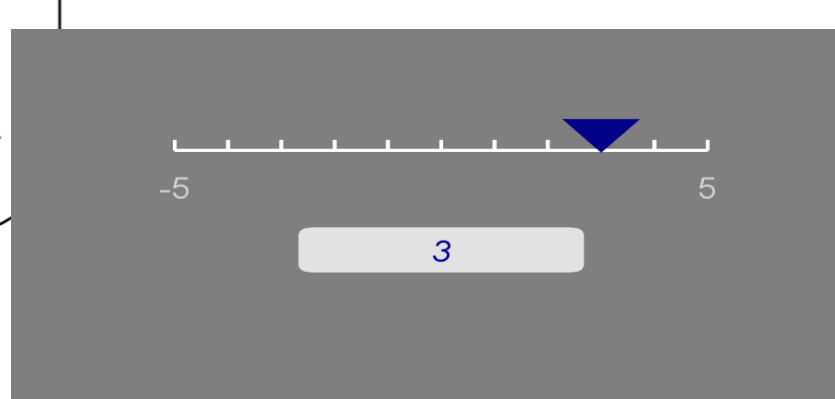


PPT: Not centered around the SMT

בחלק זה של הניסוי זה, תשמעו קטעים קצרים של צלילים בקצבים שונים. לאחר כל קטע עליכם לדרג את הקצב **ביחס לקצב שמרגיש לכם נח**, כזה שתוכלו להחזיק בו לאורך זמן, לפי הסקלה הבאה:

מהיר מאוד	נח	איטי מאוד
+5	0	-5

במהלך ההקשבה נא למקד את המבט על ה"0" במרכז המסך. לחצו על הכפתור על מנת להתחיל.



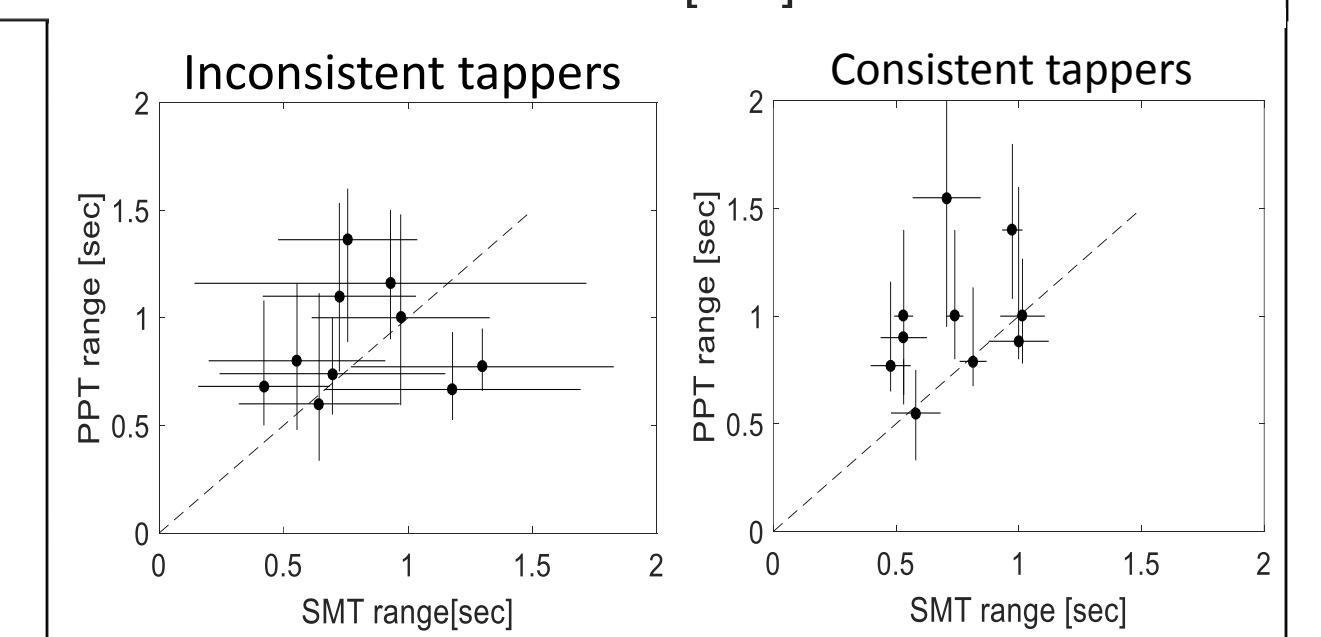
Experiment procedure:

*3, *2, 3rd task,
Break
*3, *2, 3rd task, *3

20 participants, ages 21-27.

Conclusions:

- Average results do not necessarily reflect individual behavior, and the clear SMT-PPT relation is not kept in this transformation.
 - Some of the SMT-PPT correlation found by McAuley et al. is probably due to their initial dependency.
- Can SMT and PPT be defined and measured in a way that will lead to greater correlation and lesser variability?



Improving methods accuracy

SMT:

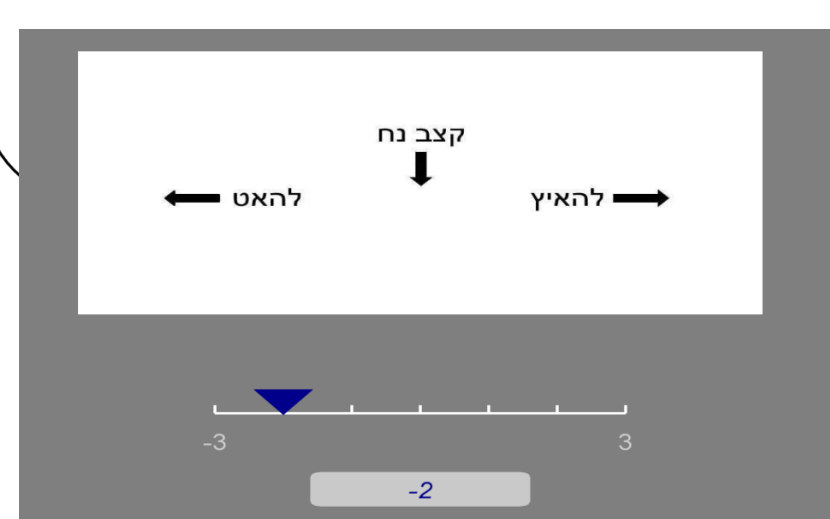
תופפו עם האצבע בקצב **קבוע שנה לכם לספור בו**. לא מהיר מדי ולא איטי מדי. יש לספור בדיוק 10 תופופים (לספור בלב). התחילו וסיימו כשהאצבע מורמת מהמשטח.



לחצו על המקש על מנת להתחיל

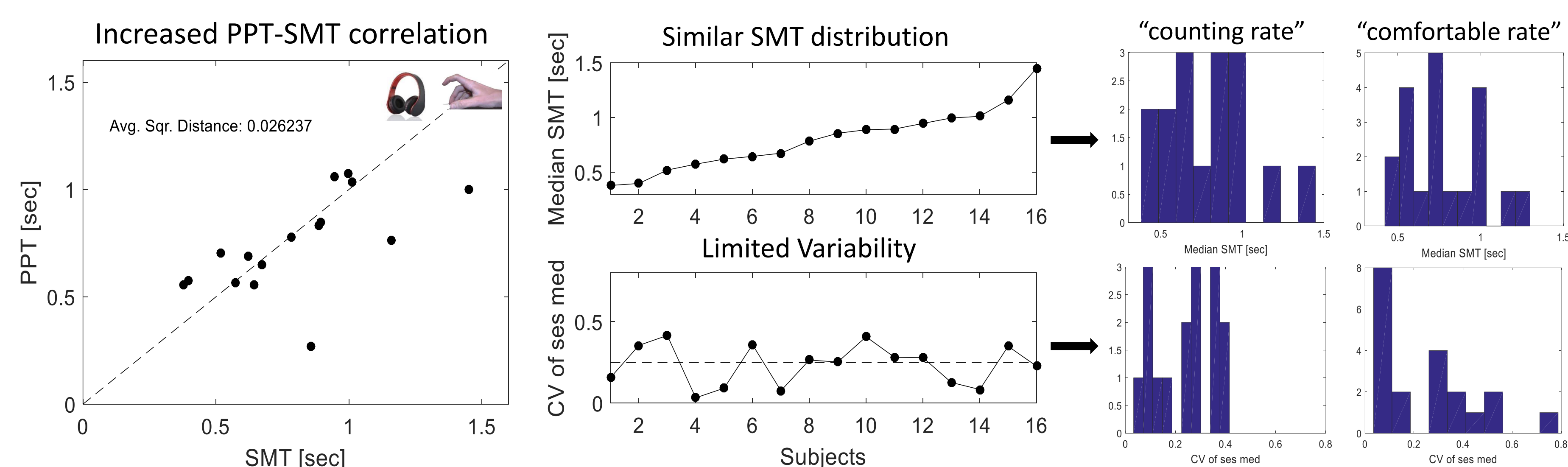
PPT:

בניסוי זה תשמעו קצב ראשוני מהיר או איטי. עליכם לשנות את הקצב (להאט/להאיץ) עד שתגיעו **לקצב שנה לכם לספור בו**. יש לספור עם הקצב (בלב).



Behavioral Data:

16 participants, ages 20-28.



Conclusions

Establishing individual preferred rhythms is not trivial. Our results indicate that while some individuals display consistent motor and perceptual rhythms, others demonstrate vast variability in both measures, at least when general instructions were used ("comfortable rate"). Some of the within-subject variability was reduced when instructions were more specific ("counting rate"), suggesting that at least within a particular context individual rhythms are reproducible both within and across modalities. However, the degree to which these rhythms can be considered characteristic of a particular individual across modalities and tasks remains an open question. Our results also raise an important cautionary note regarding the over-interpretation of group-level results, which may not accurately capture individual variability.