

Neural speech tracking shifts from the syllabic to the modulation rate of speech as intelligibility decreases

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1 Questions

Are low level linguistic and acoustic information in continuous speech tracked differently with changing intelligibility?

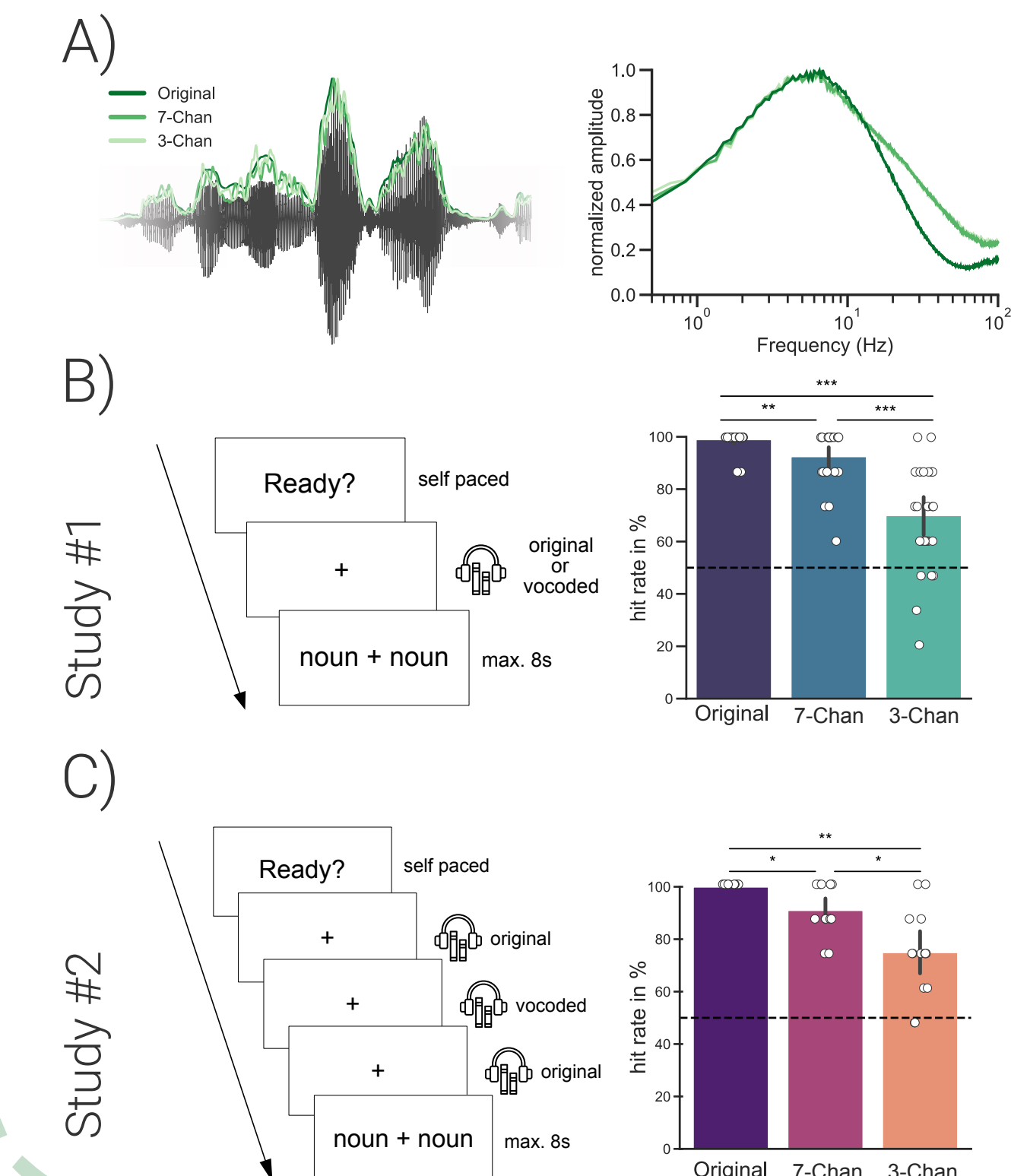
How does this tracking unfold at subcortical vs. cortical processing stages?

2 Method & Procedure

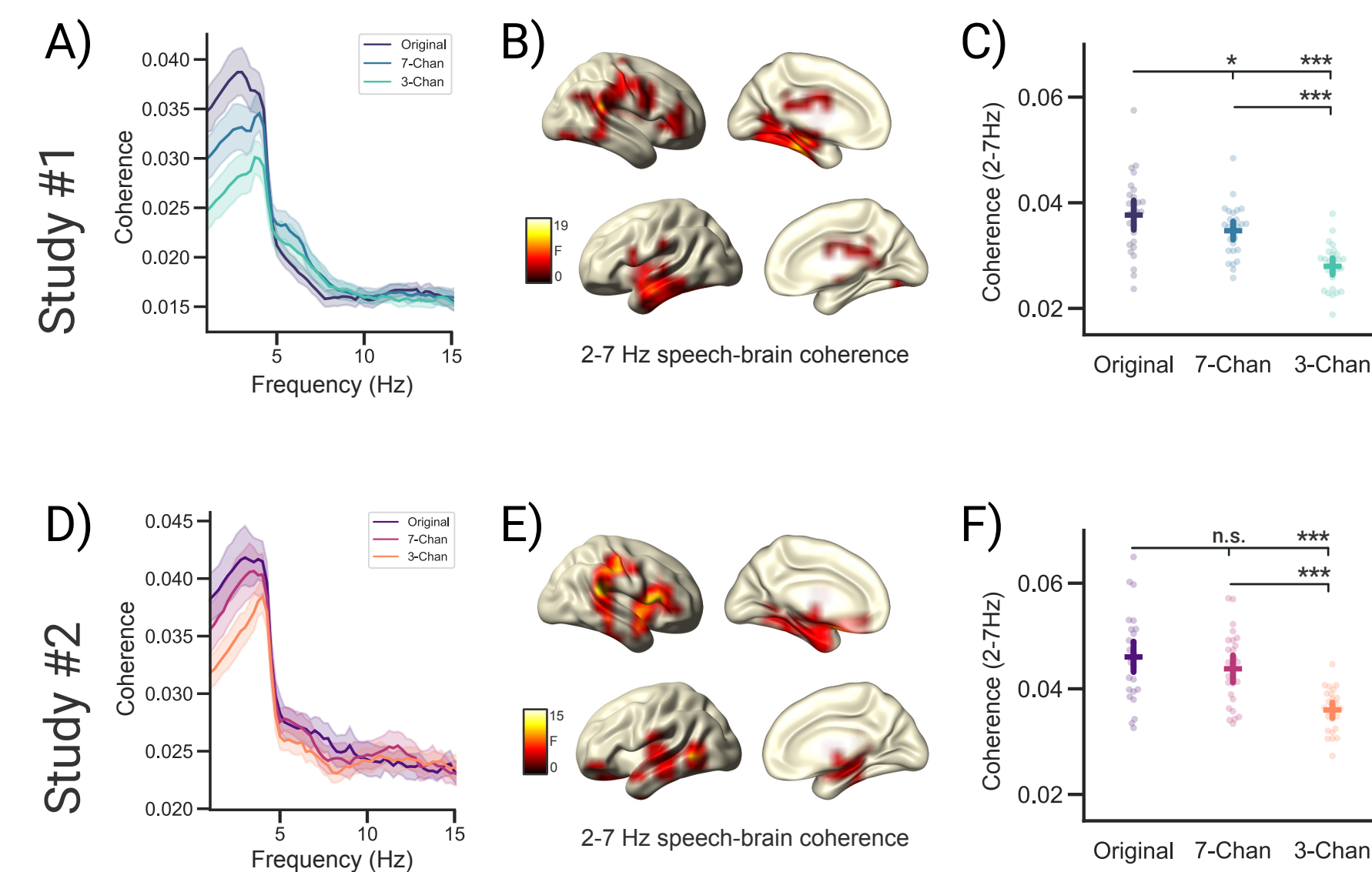
Subjects (N=52; split across 2 studies -> B & C) listened to an audiobook narrated by a female speaker whilst seated in the MEG.

Parts of the audiobook were vocoded (A; 7-Chan, 3-Chan).

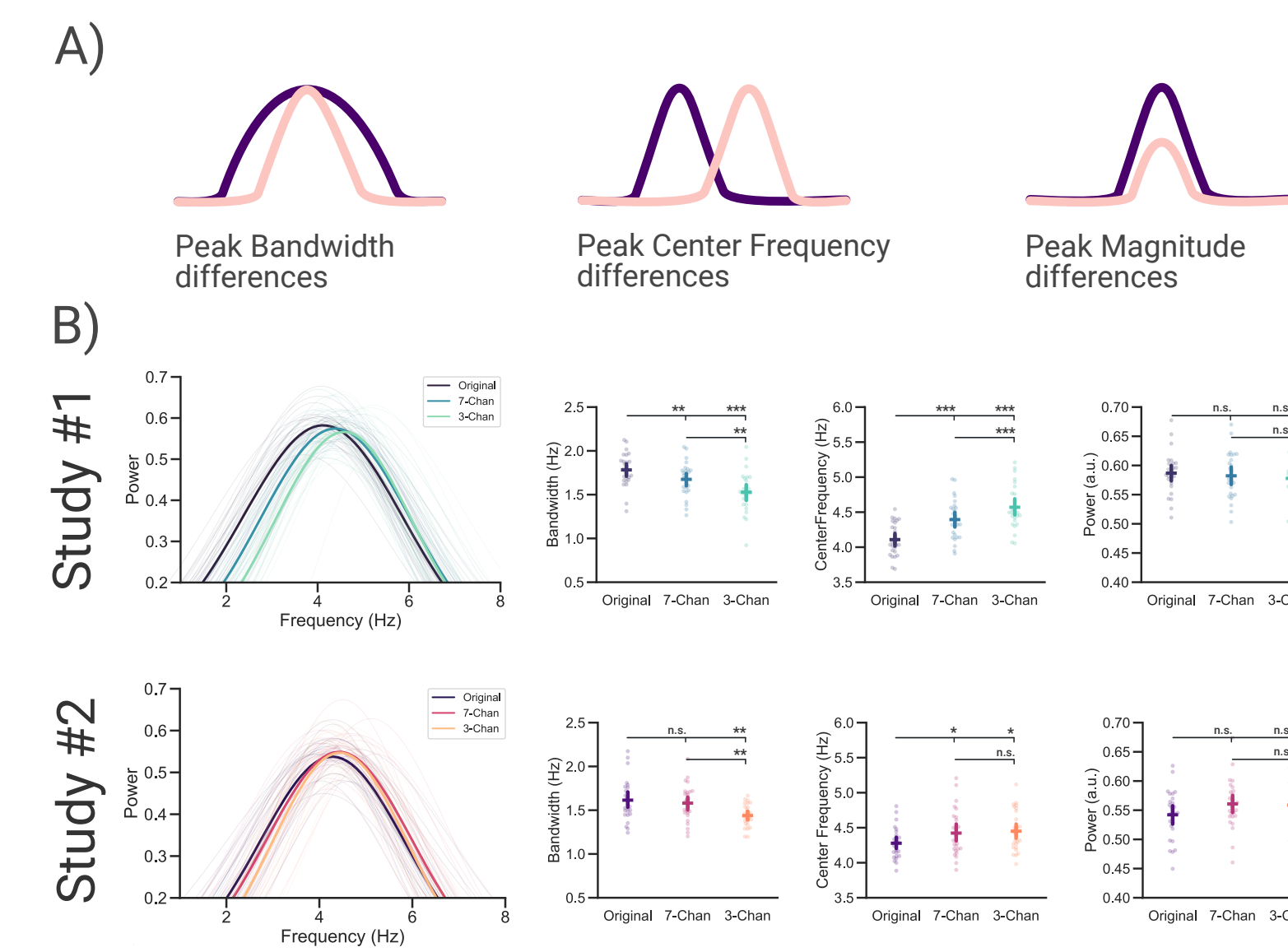
Vocoding levels were either kept continuous throughout a block (B) or changed intermittently within a block (C)



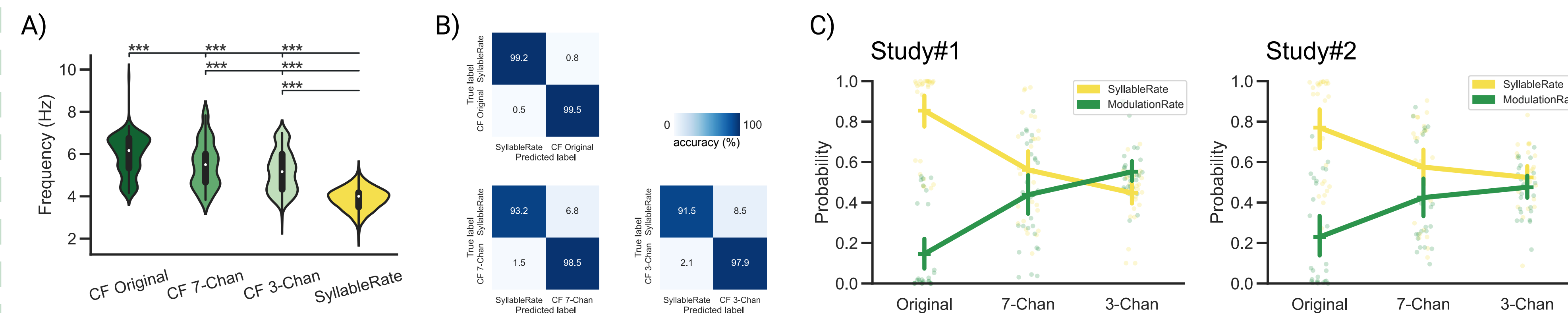
3 As speech intelligibility declines low frequency speech brain coherence decreases



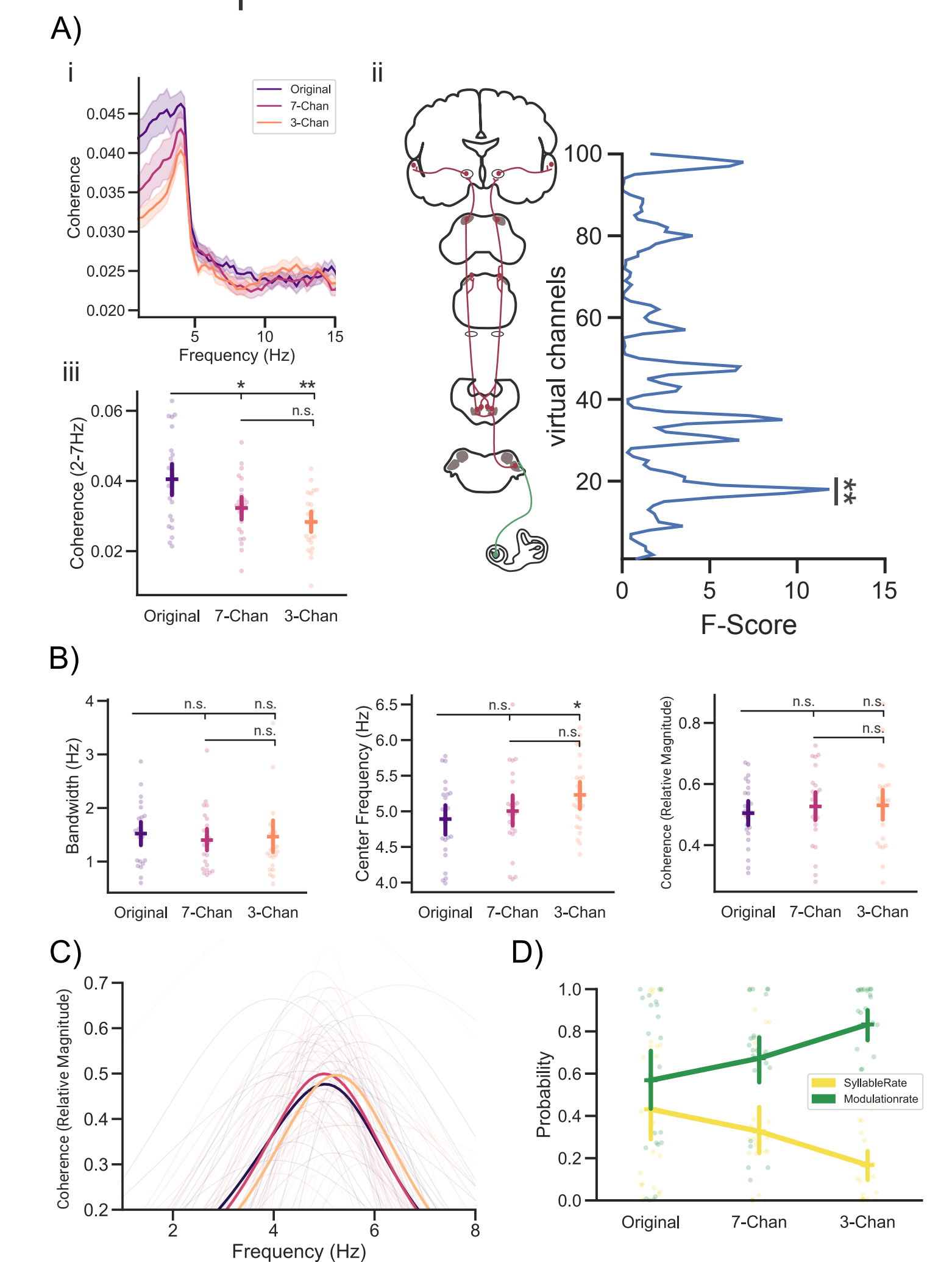
4 With a decrease in intelligibility the center frequencies of speech brain coherence increase



5 The increase in center frequencies indicates a shift in tracking from the syllabic to the modulation rate as speech intelligibility decreases



6 Modelling of subcortical activity reveals a stronger tracking of the modulation rate of speech



7 Conclusion

- Cortical activity primarily tracks the syllabic rate of speech whereas subcortical activity rather tracks the acoustic modulation rate
- As speech intelligibility decreases the probability that sub-/cortical activity tracks the syllabic rate of speech decreases