

## Supplemental Digital Content

**Supplemental table 1.**

Temporal speech parameters	Definitions
<i>Utterance length (s)</i>	Total length of the speech given by the participant (s)
<i>Articulation tempo (1/s)</i>	Total number of phonemes without pauses (count) / total length of the utterance (s)
<i>Speech tempo (1/s)</i>	Total number of phonemes including pauses (count) / total length of the utterance (s)
<i>Occurrence rate of pauses</i>	
<i>Silent pause (%)</i>	Total number of silent pauses (count) × 100 / total number of phonemes (count)
<i>Filled pause (%)</i>	Total number of filled pauses (count) × 100 / total number of phonemes (count)
<i>Total pause (%)</i>	Total number of silent and filled pauses (count) × 100 / total number of phonemes (count)
<i>Duration rate of pauses</i>	
<i>Silent pause (%)</i>	Total length of silent pauses (s) × 100 / total length of the utterance (s)
<i>Filled pause (%)</i>	Total length of filled pauses (s) × 100 / total length of the utterance (s)
<i>Total pause (%)</i>	Total length of silent and filled pauses (s) × 100 / total length of the utterance (s)
<i>Frequency of pauses</i>	
<i>Silent pause (1/s)</i>	Total number of silent pauses (count) / total length of the utterance (s)
<i>Filled pause (1/s)</i>	Total number of filled pauses (count) / total length of the utterance (s)
<i>Total pause (1/s)</i>	Total number of silent and filled pauses (count) / total length of the utterance (s)
<i>Average duration of pauses</i>	
<i>Silent pause (s)</i>	Total length of silent pauses (s) / total number of silent pauses (count)
<i>Filled pause (s)</i>	Total length of filled pauses (s) / total number of filled pauses (count)
<i>Total pause (s)</i>	Total length of silent and filled pauses (s) / total number of silent and filled pauses (count)

Supplemental table 1. The 15 temporal speech parameters that were calculated for each speech recording. (s = second)

**Supplemental table 2.**

		HC with T2DM (n = 39)		HC without T2DM (n = 34)		MCI with T2DM (n = 12)		MCI without T2DM (n = 15)	
		Age	Education	Age	Education	Age	Education	Age	Education
Utterance length (s)	$\tau_b$	-0.161	0.107	0.084	<b>0.269</b>	-0.188	<b>0.478</b>	-0.117	-0.085
	$p$	0.153	0.369	0.494	<b>0.035</b>	0.406	<b>0.044</b>	0.550	0.678
Articulation tempo (1/s)	$\tau_b$	<b>-0.221</b>	-0.146	-0.197	0.074	-0.063	<b>0.478</b>	0.137	-0.170
	$p$	<b>0.050</b>	0.221	0.108	0.562	0.782	<b>0.044</b>	0.486	0.406
Speech tempo (1/s)	$\tau_b$	<b>-0.229</b>	-0.164	-0.223	0.078	-0.063	<b>0.546</b>	0.215	-0.085
	$p$	<b>0.042</b>	0.170	0.069	0.542	0.782	<b>0.021</b>	0.273	0.678
Occurrence rates of pauses									
Silent pause (%)	$\tau_b$	0.139	0.092	0.055	-0.035	-0.031	-0.410	0.234	0.106
	$p$	0.217	0.439	0.655	0.784	0.890	0.084	0.232	0.604
Filled pause (%)	$\tau_b$	-0.093	<b>0.274</b>	-0.055	0.125	0.156	-0.102	-0.176	0.277
	$p$	0.410	<b>0.022</b>	0.655	0.329	0.489	0.666	0.370	0.177
Total pause (%)	$\tau_b$	0.060	0.193	-0.011	0.035	0.000	-0.341	0.020	0.234
	$p$	0.594	0.105	0.929	0.784	1.000	0.150	0.921	0.254
Duration rates of pauses									
Silent pause (%)	$\tau_b$	0.079	0.015	-0.029	-0.070	-0.063	-0.444	0.039	0.021
	$p$	0.482	0.901	0.812	0.583	0.782	0.061	0.842	0.917
Filled pause (%)	$\tau_b$	-0.150	<b>0.268</b>	-0.004	0.176	0.313	0.000	-0.234	<b>0.596</b>
	$p$	0.183	<b>0.025</b>	0.976	0.170	0.166	1.000	0.232	<b>0.004</b>
Total pause (%)	$\tau_b$	0.011	0.101	-0.029	-0.027	-0.094	-0.410	-0.020	0.234
	$p$	0.923	0.396	0.812	0.831	0.678	0.084	0.921	0.254
Frequency of pauses									
Silent pause (1/s)	$\tau_b$	0.033	0.095	-0.007	-0.078	-0.094	-0.341	<b>0.390</b>	0.128
	$p$	0.771	0.424	0.953	0.542	0.678	0.150	<b>0.046</b>	0.533
Filled pause (1/s)	$\tau_b$	-0.172	0.229	-0.110	0.144	0.281	0.068	-0.195	0.319
	$p$	0.127	0.055	0.372	0.259	0.213	0.774	0.319	0.120
Total pause (1/s)	$\tau_b$	-0.134	0.173	-0.055	0.059	0.250	-0.034	0.078	0.256
	$p$	0.235	0.148	0.655	0.647	0.268	0.886	0.690	0.213
Average durations of pauses									
Silent pause (s)	$\tau_b$	0.074	-0.059	0.022	-0.051	-0.125	<b>-0.580</b>	-0.332	-0.106
	$p$	0.513	0.618	0.858	0.692	0.580	<b>0.014</b>	0.090	0.604
Filled pause (s)	$\tau_b$	-0.061	0.191	0.223	0.199	0.094	-0.273	-0.117	<b>0.618</b>
	$p$	0.586	0.110	0.069	0.120	0.678	0.250	0.550	<b>0.003</b>
Total pause (s)	$\tau_b$	0.066	-0.098	0.051	-0.066	-0.125	<b>-0.615</b>	-0.098	0.106
	$p$	0.561	0.410	0.677	0.604	0.580	<b>0.010</b>	0.619	0.604

Supplemental table 2. Correlations between the 15 temporal speech parameters and demographic features (age, education) in all the 4 groups (HC with and without T2DM; MCI with and without T2DM) using the Kendall-tau correlation. The  $\tau_b$  and  $p$ -values indicating statistically significant differences (at the  $p < 0.05$  level) are in **bold**. (HC = healthy cognition; MCI = mild cognitive impairment; T2DM = type 2 diabetes mellitus)