

Effect of demographic				
	Articulation	Dynamics	Rhythm	Fluency
Population Effects				
Intercept	0.12 [-0.12, 0.36]	-0.23 [-0.5, 0.08]	0.55 [0.29-0.83]	0.87 [0.5, 1.26]
time	0.29 [0.08, 0.51]	0.21 [-0.01, 0.42]	0.04 [-0.13, 0.21]	-0.16 [-0.33, 0.02]
Age	-0.05 [-0.19, 0.09]	0.02 [-0.12, 0.17]	-0.14 [-0.27, -0.01]	-0.12 [-0.29, 0.05]
Education	0.06 [-0.04,0.16]	0.08 [-0.02, 0.18]	0.08 [-0.01, 0.17]	0.09 [-0.04, 0.21]
Male	-0.07 [-0.35, 0.2]	-0.25 [-0.52, 0.02]	0.19 [-0.06, 0.45]	0.25 [-0.08, 0.58]
Income	0.12 [-0.03, 0.27]	-0.01 [-0.17, 0.15]	0.14 [0.00, 0.28]	0.04 [-0.14, 0.23]
CogTel	0.08 [-0.06, 0.22]	0.1 [-0.04, 0.24]	0.09 [-0.04, 0.22]	0.11 [-0.07, 0.28]
Site	-0.01 [-0.28, 0.27]	0.15 [-0.13, 0.42]	-0.08 [-0.33, 0.17]	-0.25 [-0.57, 0.08]
Homework	0.03 [-0.1, 0.17]	0.01 [-0.13, 0.15]	0.03 [-0.1 0.15]	0.08 [-0.07 0.23]
Cognitive Reserve	0.13 [-0.02, 0.26]	0.06 [-0.08, 0.2]	0.16 [0.03, 0.29]	0.23 [0.06, 0.4]
Effect of demographic over time				
Population Effects				
Intercept	0.12 [-0.12, 0.36]	-0.23 [-0.5, 0.08]	0.55 [0.29-0.83]	0.87 [0.5, 1.26]
time	0.29 [0.08, 0.51]	0.21 [-0.01, 0.42]	0.04 [-0.13, 0.21]	-0.16 [-0.33, 0.02]
Age	-0.08 [-0.24, 0.08]	-0.18 [-0.35, 0.00]	0.08 [-0.07, 0.22]	0.07 [-0.09, 0.22]
Education	-0.00 [-0.12, 0.11]	-0.05 [-0.18, 0.08]	-0.04 [-0.15, 0.08]	-0.02 [-0.14, 0.1]
Male	0.22 [-0.35, 0.2]	0.23 [-0.11, 0.58]	0.08 [-0.22, 0.38]	0.03 [-0.29, 0.35]
Income	0.00 [-0.17, 0.17]	0.08 [-0.11, 0.27]	-0.09 [-0.26, 0.08]	0.03 [-0.14, 0.2]
CogTel	0.07 [-0.08, 0.23]	0.03 [-0.04, 0.24]	-0.05 [-0.2, 0.11]	-0.04 [-0.2, 0.13]
Site	0.06 [-0.25, 0.38]	-0.1 [-0.44, 0.24]	-0.06 [-0.36, 0.24]	0.22 [-0.09, 0.53]
Homework	0.11 [-0.07, 0.28]	0.06 [-0.13, 0.26]	0.01 [-0.16, 0.18]	0.07 [-0.11, 0.24]
Cognitive Reserve	-0.03 [-0.18, 0.13]	0.07 [-0.11, 0.25]	-0.03 [-0.18, 0.12]	-0.07 [-0.24, 0.09]
Effect of demographic at difficult 1				
Population Effects				
Intercept	0.37 [0.14, 0.62]	0.03 [-0.26, 0.36]	0.51 [0.19, 0.85]	0.51 [0.19, 0.86]
Age	0.01 [-0.14, 0.16]	-0.02 [-0.17, 0.13]	0.03 [-0.12, 0.17]	-0.05 [-0.26, 0.17]
Education	0.09 [-0.03, 0.2]	0.03 [-0.08, 0.14]	0.03 [-0.07, 0.14]	0.09 [-0.07, 0.25]
Male	-0.1 [-0.39, 0.22]	-0.2 [-0.48, 0.09]	0.08 [-0.21, 0.37]	0.29 [-0.13, 0.7]
Income	0.04 [-0.12, 0.21]	0.1 [-0.06, 0.25]	-0.03 [-0.18, 0.13]	0.01 [-0.22, 0.24]
CogTel	0.1 [-0.05, 0.24]	0.1 [-0.04, 0.24]	0.08 [-0.05, 0.22]	0.07 [-0.14, 0.28]
Site	-0.07 [-0.36, 0.22]	-0.06 [-0.35, 0.23]	-0.24 [-0.52, 0.03]	-0.23 [-0.64, 0.18]
Homework	0.11 [-0.04, 0.26]	0.1 [-0.06, 0.25]	0.07 [-0.08, 0.23]	0.09 [-0.14, 0.31]
Cognitive Reserve	0.1 [-0.06, 0.25]	0.19 [0.04, 0.33]	0.14 [0.00, 0.28]	0.21 [-0.00, 0.42]

	better scores, difficult 0								more improven			
	Age	Educatio n	Sex	Income	CogTel	Site	Home- work	CR	Age	Educatio n	Sex	Income
Articulation	-	-	-	higher 95%	-	-	-	higher 96%	-	-	m 92%	-
Dynamics	-	-	f 97%	-	higher 92%	G 86%	-	-	less	-	m 90%	-
Rhythm	less	-	m 93%	higher	-	-	-	higher	-	-	-	-
Fluency	less 92%	-	m 93%	-	higher 89%	H 93%	-	higher	-	-	-	-
Pitch	-	-	f 85%	-	higher	-	-	higher	-	lower 90%	m 81%	-
Expressivity	-	-	-	-	-	H 82%	-	-	-	-	m 78%	-

Effect of goldMSI				
	Articulation	Dynamics	Rhythm	Fluency
Population Effects				
Intercept	0.12 [-0.12, 0.36]	-0.23 [-0.5, 0.08]	0.55 [0.29-0.83]	0.87 [0.5, 1.26]
time	0.29 [0.08, 0.51]	0.21 [-0.01, 0.42]	0.04 [-0.13, 0.21]	-0.20 [-0.39, 0.00]
Musical Engagement	0.02 [-0.12, 0.17]	0.01 [-0.13, 0.15]	0.09 [-0.04, 0.22]	0.06 [-0.11, 0.23]
Perceptual Abilities	0.04 [-0.1, 0.18]	0.04 [-0.1, 0.18]	0.09 [-0.05, 0.22]	0.07 [-0.11, 0.25]
Musical Training	-0.03 [-0.17, 0.11]	0.07 [-0.07, 0.2]	0.04 [-0.09, 0.17]	-0.03 [-0.2, 0.14]
Emotions	- 0.01 [-0.15, 0.14]	0.14 [0.01, 0.28]	0.05 [-0.08, 0.19]	0.06 [-0.11, 0.24]
Singing Abilities	-0.01 [-0.15, 0.12]	-0.01 [-0.15, 0.13]	0.02 [-0.11, 0.15]	-0.03 [-0.19, 0.15]
General Sophistication	-0.01 [-0.15, 0.12]	0.01 [-0.13, 015]	0.07 [-0.06, 0.2]	0.03 [-0.14, 0.2]
Effect of goldMSI over time				
Population Effects				
Intercept	0.12 [-0.12, 0.36]	-0.23 [-0.5, 0.08]	0.55 [0.29-0.83]	0.87 [0.5, 1.26]
time	0.29 [0.08, 0.51]	0.21 [-0.01, 0.42]	0.04 [-0.13, 0.21]	-0.20 [-0.39, 0.00]
Musical Engagement	-0.21 [-0.27, -0.06]	-0.09 [-0.27, 0.09]	-0.17 [-0.32, -0.01]	-0.06 [-0.23, 0.1]
Perceptual Abilities	-0.1 [-0.25, 0.05]	-0.06 [-0.24, 0.12]	-0.04 [-0.19, 0.11]	0.04 [-0.12, 0.2]

Effect of goldMSI				
	Articulation	Dynamics	Rhythm	Fluency
Musical Training	-0.14 [-0.29, 0.02]	-0.11 [-0.28, 0.07]	-0.04 [-0.19, 0.11]	0.1 [-0.05, 0.26]
Emotions	-0.16 [-0.31, 0.00]	-0.27 [-0.42, -0.1]	-0.15 [-0.3, 0.00]	-0.1 [-0.26, 0.05]
Singing Abilities	-0.2 [-0.35, -0.05]	-0.1 [-0.28, 0.07]	-0.03 [-0.18, 0.12]	0.04 [-0.12, 0.2]
General Sophistication	-0.19 [-0.34, -0.05]	-0.1 [-0.27, 0.08]	-0.07 [-0.22, 0.09]	0.03 [-0.13, 0.19]

Effect of goldMSI at difficult 1				
Population Effects				
Intercept	0.36 [0.13, 0.62]	0.03 [-0.27, 0.35]	0.51 [0.18, 0.86]	0.51 [0.2, 0.85]
Musical Engagement	-0.03 [-0.18, 0.13]	-0.09 [-0.24, 0.06]	0.04 [-0.11, 0.19]	0.04 [-0.18, 0.27]
Perceptual Abilities	0.1 [-0.05, 0.25]	0.02 [-0.13, 0.16]	0.14 [0.00, 0.27]	0.24 [0.03, 0.44]
Musical Training	-0.01 [-0.15, 0.14]	-0.01 [-0.16, 0.14]	0.05 [-0.09, 0.19]	0.04 [-0.17, 0.25]
Emotions	-0.07 [-0.22, 0.07]	-0.1 [-0.24, 0.04]	0.01 [-0.14, 0.15]	0.04 [-0.18, 0.25]
Singing Abilities	0.07 [-0.08, 0.22]	0.02 [-0.12, 0.17]	0.07 [-0.08, 0.21]	0.15 [-0.06, 0.36]
General Sophistication	0.07 [-0.08, 0.22]	0.00 [-0.15, 0.15]	0.12 [-0.05, 0.26]	0.2 [-0.02, 0.41]
	better scores, difficult 0			more improvement

	Engagement	Perceptual Abilities	Musical Training	Emotions	Singing Abilities	General Sophistication	Engagement	Perceptual Abilities	Musical Training
Articulation	-	-	-	-	-	-	lower	lower 71%	lower 67%
Dynamic	-	-	-	higher	-	-	-	-	lower 83%
Rhythm	-	-	-	-	-	-	lower	-	-
Fluency	-	-	-	-	-	-	-	-	higher 65%
Pitch	-	-	-	-	-	-	lower	lower 79%	lower 57%
Expressiveness	-	-	-	-	-	-	-	-	-

higher scores, difficult 0	more improvement, difficult 0	higher scores difficult 1
		Hannover
higher income		higher income
higher CogTel	lower CogTel	higher CogTel
	low education	
more Cognitive Reserve	less Cognitive Reserve	more Cognitive Reserve
younger	younger	younger
	more homework	more homework
	male	
	low musical engagement	
	low perceptual abilities	high perceptual abilities
high musical emotions	low musical emotions	low musical emotions
	low singing abilities	high singing abilities
	low musical training	
	low general sophistication	high general sophistication

Musicality	(difficult0 time0)	Time interactions (difficult 0 time 1)	difficult 1 time 1
Intercept	2.36 [2.25, 2.47]		2.18 [2.03, 2.32]

time	0.26 [0.12, 0.40]		
Age	-0.21 [-0.33, -0.09]	-0.10 [-0.27, 0.06]	-0.10 [-0.24, 0.04]
Education	0.23 [0.15, 0.32]	-0.12 [-0.29, 0.05]	0.20 [0.06, 0.34]
Male	0.19 [-0.04, 0.43]	0.14 [-0.03, 0.31]	0.12 [-0.03, 0.27]
Income	0.29 [0.16, 0.42]	-0.04 [-0.21, 0.14]	0.05 [-0.09, 0.19]
CogTel	0.31 [0.19, 0.42]	-0.03 [-0.2, 0.14]	0.26 [0.11, 0.40]
Site	-0.25 [-0.49, -0.02] (Hannover)	0.11 [-0.05, 0.28]	-0.31 [-0.45, -0.17]
Homework	0.29 [0.18, 0.41]	0.10 [-0.08, 0.27]	0.23 [0.08, 0.28]
Cognitive Reserve	0.49 [0.38, 0.60]	-0.2 [-0.36, -0.02]	0.47 [0.33, 0.61]
Musical Engagement	0.08 [-0.04, 0.2]	-0.32 [-0.5, -0.15]	0.02 [-0.13, 0.16]
Perceptual Abilities	0.13 [0.02, 0.25]	-0.14 [-0.31, 0.03]	0.36 [0.22, 0.50]
Musical Training	-0.02 [-0.14, 0.10]	-0.05 [-0.23, 0.11]	0.03 [-0.11, 0.18]
Emotions	-0.01 [-0.13, 0.12]	-0.37 [-0.53, -0.2]	-0.09 [-0.23, 0.06]
Singing Abilities	0.00 [-0.12, 0.12]	-0.28 [-0.45, -0.1]	0.19 [0.05, 0.34]
General Sophistication	0.04 [-0.07, 0.16]	-0.23 [-0.4, -0.05]	0.26 [0.12, 0.41]

Effect of demographic		absolute frequencies of demographic predictors		
		Pitch	demographic	time:demographic
Population Effects				dem, difficult1
Intercept	1.24 [0.89, 1.62]	0.45 [0.08, 0.87]		
time	0.04 [-0.18, 0.27]	0.07 [-0.09 0.24]		
Age	-0.03 [-0.2, 0.13]	-0.07 [-0.19, 0.04]		
Education	0.08 [-0.04, 0.2]	0.02 [-0.07, 0.1]		
Male	-0.17 [-0.49, 0.15]	-0.01 [-0.17, 0.41]	2	1
Income	0.04 [-0.14, 0.21]	0.03 [-0.1, 0.15]		
CogTel	0.2 [0.04, 0.36]	0.05 [-0.07, 0.16]		
Site	-0.01 [-0.33, 0.31]	-0.11 [-0.33, 0.12]	0	1
Homework	0.03 [-0.13, 0.18]	0.00 [-0.11, 0.11]		
Cognitive Reserve	0.18 [0.09, 0.34]	0.06 [-0.05, 0.18]	4	3
Effect of demographic over time				
		Income	2	0
Population Effects				
Intercept	1.24 [0.89, 1.62]	0.45 [0.08, 0.87]		
time	0.04 [-0.18, 0.27]	0.07 [-0.09 0.24]		
Age	0.08 [-0.12, 0.28]	-0.06 [-0.21, 0.09]	3	1
Education	-0.1 [-0.25, 0.05]	0.03 [-0.08, 0.14]		
Male	0.18 [-0.22, 0.58]	0.12 [-0.17, 0.41]		
Income	0.05 [-0.17, 0.27]	0.07 [-0.09, 0.22]	3	4
CogTel	-0.13 [-0.33, 0.08]	0.03 [-0.12, 0.18]		
Site	0.18 [-0.21, 0.57]	0.11 [-0.18, 0.39]		
Homework	0.15 [-0.08, 0.38]	0.1 [-0.06, 0.25]	0	3
Cognitive Reserve	-0.22 [-0.43, -0.02]	0.05 [-0.11, 0.19]		2
Effect of demographic at difficult 1		Cognitive Reserve	4	1
Population Effects				
Intercept	1.06 [0.69, 1.45]	0.54 [0.15, 0.97]		
Age	-0.15 [-0.33, 0.02]	0.05 [-0.09, 0.19]		
Education	-0.01 [-0.15, 0.13]	0.06 [-0.04, 0.16]		
Male	0.19 [-0.15, 0.54]	0.09 [-0.19, 0.36]		
Income	0.00 [-0.19, 0.20]	0.01 [-0.13, 0.16]		
CogTel	0.11 [-0.07, 0.29]	0.05 [-0.09, 0.18]		
Site	-0.25 [-0.59, 0.1]	-0.18 [-0.45, 0.09]		
Homework	0.09 [-0.1, 0.27]	0.00 [-0.14, 0.15]		
Cognitive Reserve	0.16 [-0.02, 0.33]	0.12 [-0.02, 0.25]		

	worse scores, difficult 0				better scores, difficult 1							
	CogTel	Site	Homework	CR	Age	Education	Sex	Income	CogTel	Site	Homework	CR
Articulation	-	-	more 88%	-	-	-	f 74%	-	higher 91%	-	more 92%	higher 54%
Dynamics	-	H 73%	-	-	-	-	-	higher 89%	higher 91%	-	more 90%	higher
Rhythm	-	-	-	-	-	-	-	-	-	H 96%	-	higher
Fluency	-	G 93%	-	-	-	-	m 91%	-	-	H 87%	-	higher
Pitch	lower 89%	G 82%	more 92%	lower	less 96%	-	m 86%	-	higher 90%	H 92%	-	higher 57%
Expressivity	-	G 77%	more 89%	-	-	-	-	-	-	H 91%	-	higher 55%

Effect of goldMSI		absolute frequencies of goldMSI predictors		
		Pitch	Expressivity	time:demographic
Population Effects				dem, difficult1
Intercept	1.24 [0.89, 1.62]	0.45 [0.08, 0.87]		
time	0.04 [-0.18, 0.27]	0.07 [-0.09 0.24]		
Musical Engagement	0.13 [-0.03, 0.29]	-0.02 [-0.14, 0.1]		
Perceptual Abilities	0.07 [-0.01, 0.15]	0.00 [-0.12, 0.12]	0	3
Musical Training	0.01 [-0.05, 0.07]	0.04 [-0.08, 0.16]		
Emotions	0.06 [-0.02, 0.14]	0.03 [-0.09, 0.14]		
Singing Abilities	0.06 [-0.02, 0.14]	-0.02 [-0.14, 0.09]		2
General Sophistication	0.08 [-0.04, 0.2]	-0.01 [-0.13, 0.1]		3
Effect of goldMSI over time				
			0	3
Population Effects				
Intercept	1.24 [0.89, 1.62]	0.45 [0.08, 0.87]		
time	0.04 [-0.18, 0.27]	0.07 [-0.09 0.24]		
Musical Engagement	-0.25 [-0.49, -0.01]	0.00 [-0.15, 0.14]	1	5
Perceptual Abilities	-0.18 [-0.38, 0.02]	-0.05 [-0.19, 0.1]		1

Effect of goldMSI			0		3	1
	Pitch	Singing Abilities	Expressivity			
Musical Training	-0.02 [-0.05, 0.01]		-0.07 [-0.22, 0.08]			
Emotions	-0.33 [-0.45, -0.21]		-0.1 [-0.24, 0.05]			
Singing Abilities	-0.18 [-0.3, -0.06]		0.01 [-0.14, 0.16]			
General Sophistication	-0.2 [-0.3, -0.1]	General Sophistication	-0.02 [-0.16, 0.12]		3	3
Effect of goldMSI at difficult 1						

Population Effects		
Intercept	1.05 [0.69, 1.43]	0.54 [0.16, 0.96]
Musical Engagement	0.01 [-0.16, 0.2]	0.03 [-0.12, 0.17]
Perceptual Abilities	0.02 [-0.16, 0.2]	0.13 [-0.01, 0.26]
Musical Training	-0.03 [-0.21, 0.15]	0.04 [-0.1, 0.17]
Emotions	-0.07 [-0.25, 0.1]	0.00 [-0.14, 0.14]
Singing Abilities	-0.02 [-0.2, 0.16]	0.06 [-0.08, 0.2]
General Sophistication	-0.01 [-0.19, 0.18]	0.1 [-0.04, 0.24]

better scores, difficult 1

	Emotions	Singing Abilities	General Sophistication	Engagement	Perceptual Abilities	Musical Training	Emotions	Singing Abilities	General Sophistication
Articulation	lower	lower	lower	-	higher 91%	-	-	-	-
Dynamic	lower	lower 88%	lower 86%	-	-	-	lower 92%	-	-
Rhythm	lower	-	-	-	higher	-	-	-	higher 95%
Fluency	lower 91%	-	-	-	higher	-	-	higher 92%	higher 97%
Pitch	lower	lower 96%	lower	-	-	-	-	-	-
Expressiveness	-	-	-	-	-	-	-	-	higher 91%

