

# **ASSESSING MUSICAL PREFERENCES OF CHILDREN ON THE AUTISTIC SPECTRUM: IMPLICATIONS FOR THERAPY**

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**IMMERSIVE**  
SOUND AND MUSIC COMPUTING

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by:

- Poor communication and language skills
- Restricted and repetitive patterns of behaviour
- Deficits in social interactions.

Around 1 in 100 children worldwide has autism

Music-based therapies have been yielding favorable clinical outcomes in autistic children

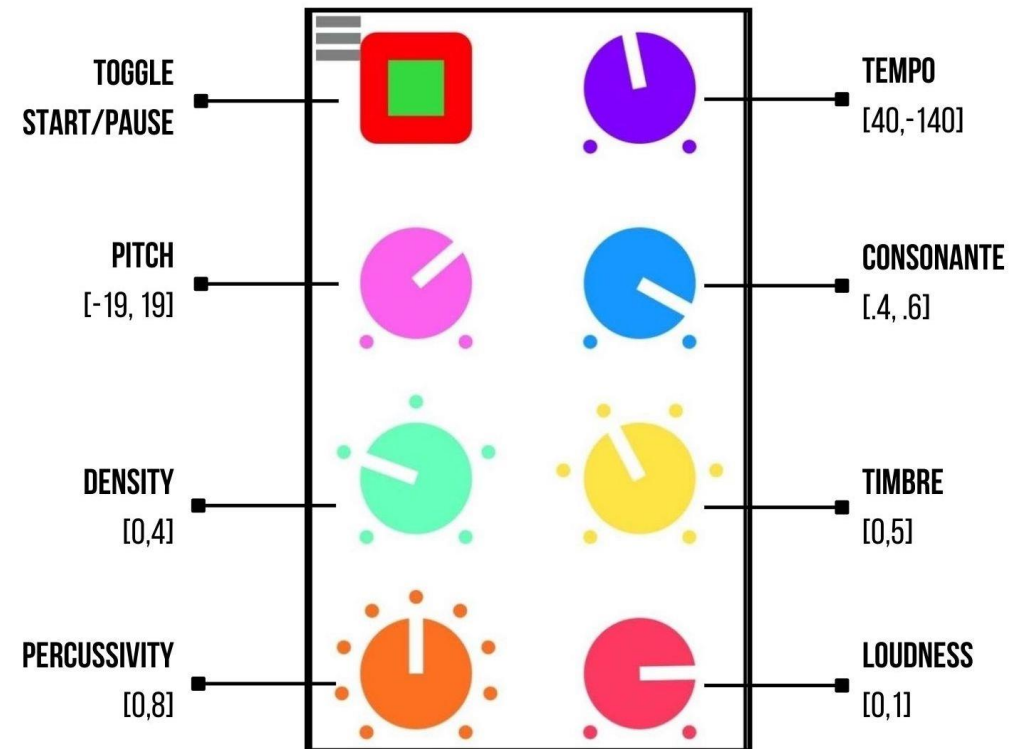
There is a lack of guidelines for content selection in music-based interventions

# METHODOLOGY

- Generative music system, running on a touch screen mobile handheld device with seven manipulable musical parameters

- 18 Children with ASD

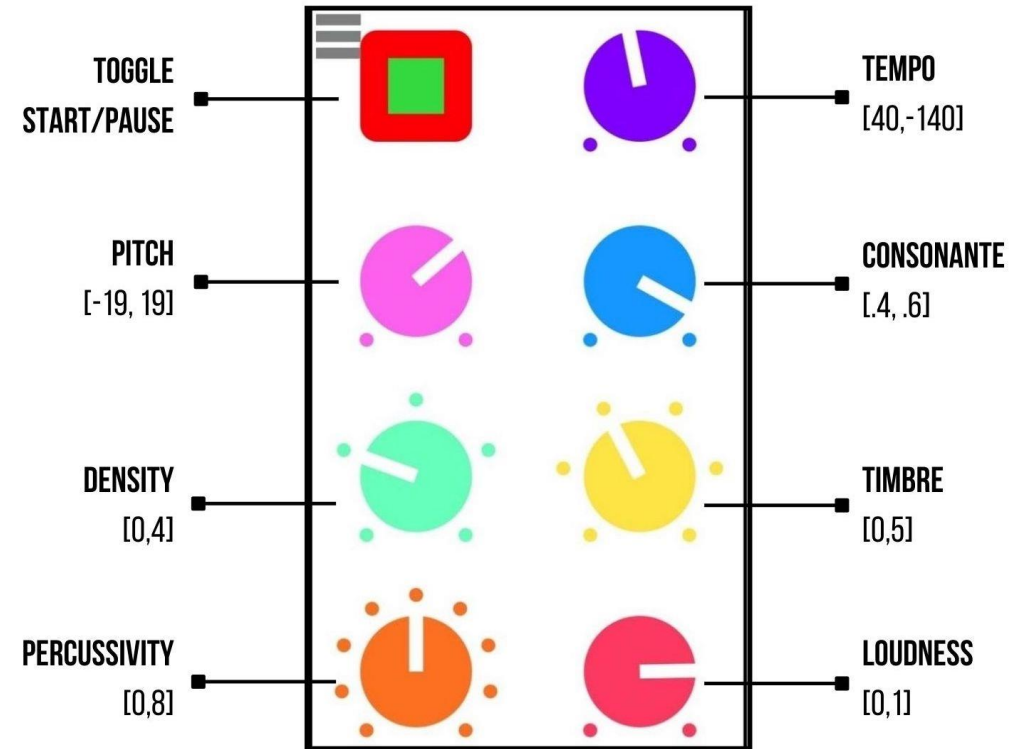
- 1 or 2 Therapeutic Sessions



# METHODOLOGY

## ■ Investigate:

- 1) what the preferences are within the various musical parameters
- 2) whether there are any correlations between them
- 3) whether this preference is constant or changes between therapy sessions



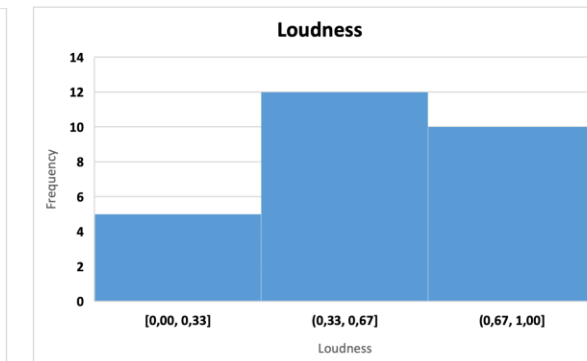
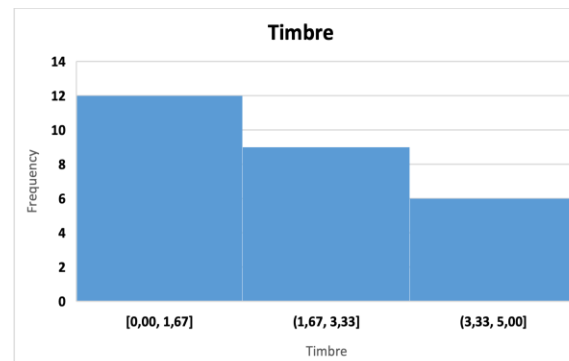
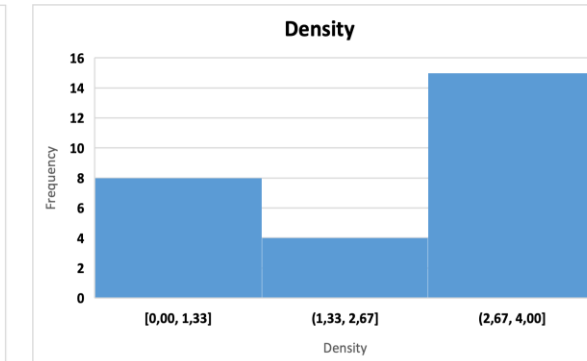
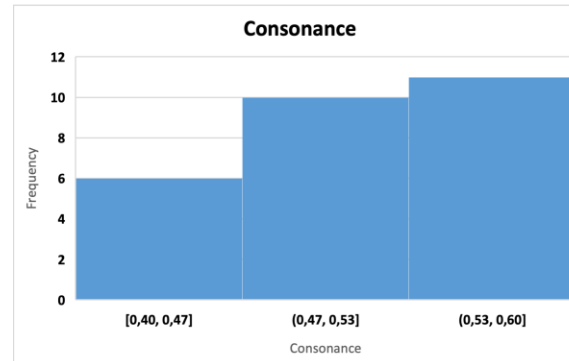
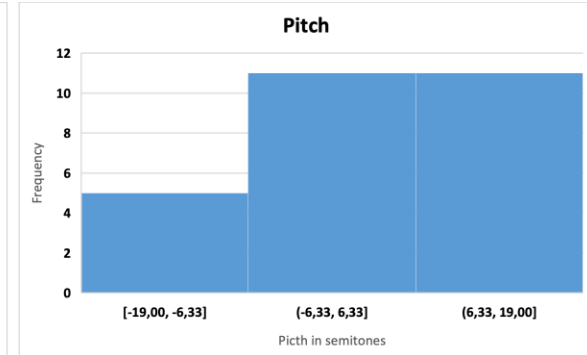
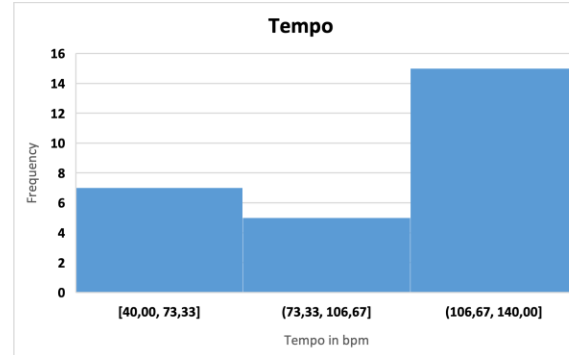
## ■ RESULTS

### ■ I) Preferences within the various musical parameters

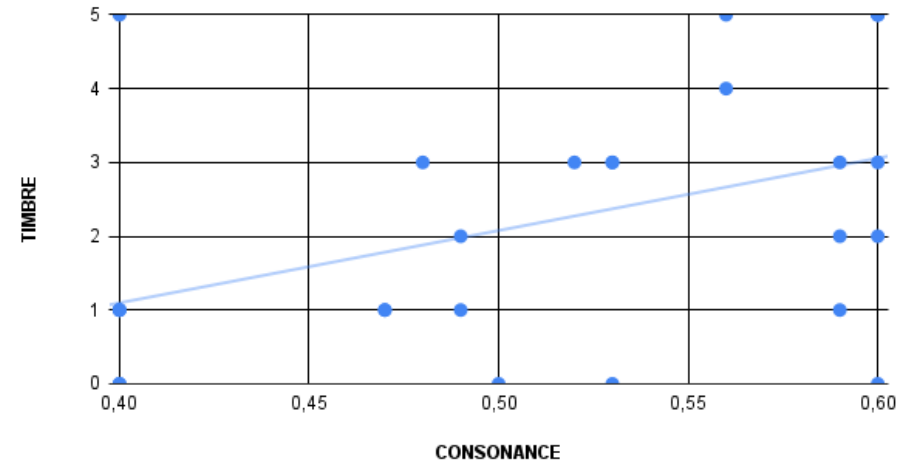
ID	Tempo [40,-140]	Pitch [-19,19]	Cons [.4,.6]	Dens [0-4]	Timbre [0,5]	Perc [0,8]	Loud [0,1]
P.ID01	40	14	.56	3	5	0	.83
P.ID02	140	18	.4	1	0	0	.97
P.ID03	75	-4	.6	0	2	1	0
P.ID04	47	19	.6	4	3	0	.66
P.ID05	107	-19	.59	0	1	4	.45
P.ID06	140	-1	.49	2	2	4	.51
P.ID07	137	18	.53	3	0	2	.56
P.ID08	88	0	.4	4	1	2	.65
P.ID09	107	6	.53	3	3	5	.58
P.ID10	40	19	.4	4	0	5	1
P.ID11	76	-2	.48	2	3	6	1
P.ID12	107	6	.53	3	3	5	.58
P.ID13	136	17	.6	4	5	8	0
P.ID14	140	17	.6	4	5	8	1
P.ID15	47	-19	.4	0	1	8	.48
P.ID01	67	1	.49	0	1	8	.83
P.ID02	128	4	.5	0	0	8	.68
P.ID03	133	19	.47	1	1	1	.72
P.ID05	140	0	.59	3	2	3	.32
P.ID07	137	16	.4	3	5	4	.49
P.ID08	92	0	.52	2	3	4	.5
P.ID09	46	-12	.59	0	3	8	.47
P.ID11	115	-11	.6	4	5	2	.96
P.ID15	88	0	.4	4	1	2	.65
P.ID16	118	10	.56	3	4	6	.73
P.ID17	113	-9	.6	2	0	4	.16
P.ID18	44	14	.47	4	1	7	.28
Mean	101.75	2,67	.52	2.17	2.17	4.75	.57
STD%	33.6	389.5	13.5	73.3	82.9	53.9	42.1
Skew	-.39	-.41	-.39	-.47	.36	-.01	-.43

## ■ RESULTS

### ■ *I) Preferences within the various musical parameters*

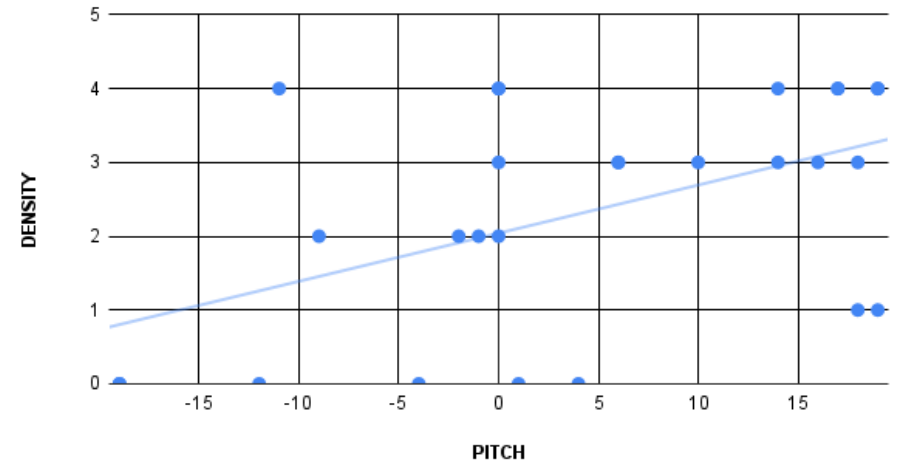


	Pitch	Cons	Dens	Timbre	Perc	Loud
Tempo	.18	.12	.06	.08	-.07	-.06
Pitch		-.16	.50	.13	-.20	.24
Cons			0	.42	.03	-.32
Dens				.38	-.18	.14
Timbre					.08	.06
Perc						-.09



## ■ RESULTS

### ■ 2) *Correlations between parameters*



## ■ RESULTS

■ 3) *Participant's consistency across sessions*

ID	$r$	$p$	$R^2$
P.ID01	.09	.11	.01
P.ID02	.75	.77	.56
P.ID03	-.04	.65	0
P.ID05	.75	.05	.57
P.ID07	-.05	.83	0
P.ID08	-.85	.60	.72
P.ID09	-.63	.19	.40
P.ID11	.28	.09	.08
P.ID15	-.34	.11	.11



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## CONCLUSIONS

- Preference for music with faster tempos, higher pitch, more consonant music, high density, more sustained timbres and percussive elements
- Positive linear relationships observed between music density and pitch, as well as between timbre and consonance.
- Consistency of musical preferences varied greatly between sessions

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## FUTURE WORK

- Explore the relationship between musical preferences and behavioral responses
- Investigate the impact of sensory sensitivity
- Compare preferences across different ASD profiles
- Apply the protocol to children without ASD to infer differences to children outside of the ASD

## REFERENCES

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