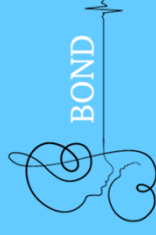


Creative Music Therapy and Heart Rate Variability in Newborns With Congenital Heart Disease And Their Mothers

A Longitudinal Study From Birth to 6 Months of Age



BOND

Research Group
Prof. Dr. med. Cornelia Hagmann, PhD

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by
Vithusan Somasundaram

May 19, 2026



BACKGROUND

Newborns with Congenital Heart Disease | Creative Music Therapy | Heart Rate Variability



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BACKGROUND

Newborns with Congenital Heart Disease | Creative Music Therapy | Heart Rate Variability



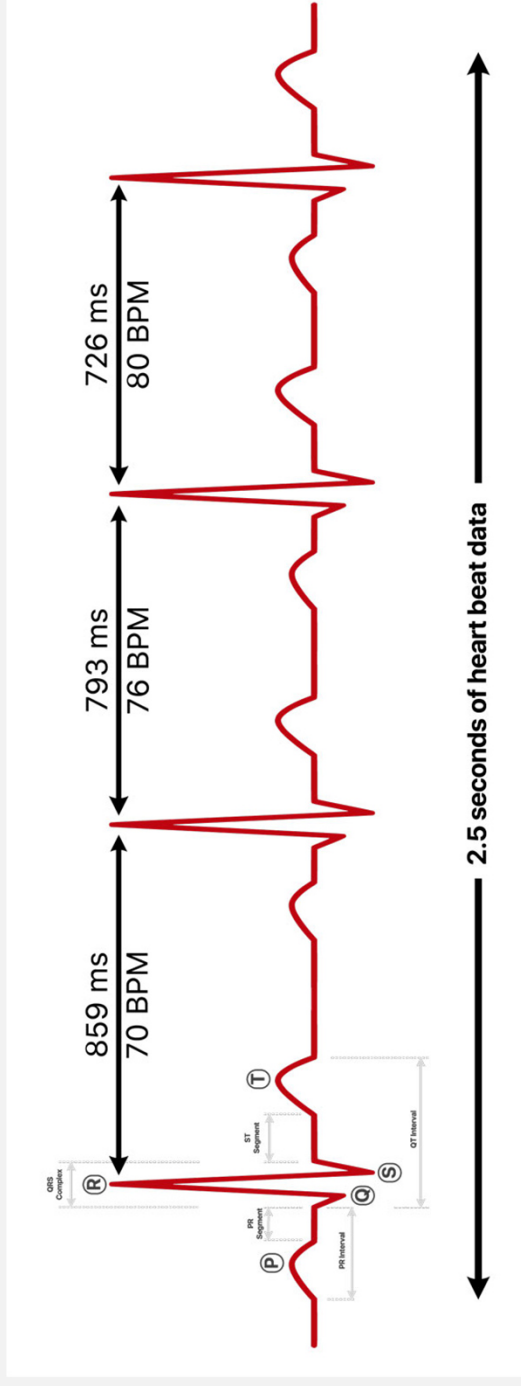
represents a distinct, **interaction-based intervention** grounded in **real-time co-regulation**, using **improvised, infant-directed singing and humming** within a **family-centered and resource-oriented therapeutic framework**

(Haslbeck, F. B., 2014)

BACKGROUND

Newborns with Congenital Heart Disease | Creative Music Therapy | Heart Rate Variability

The physiological window: Heart Rate Variability





HIGH HRV

Demonstrates autonomous flexibility, cardiovascular health and stress **resilience**

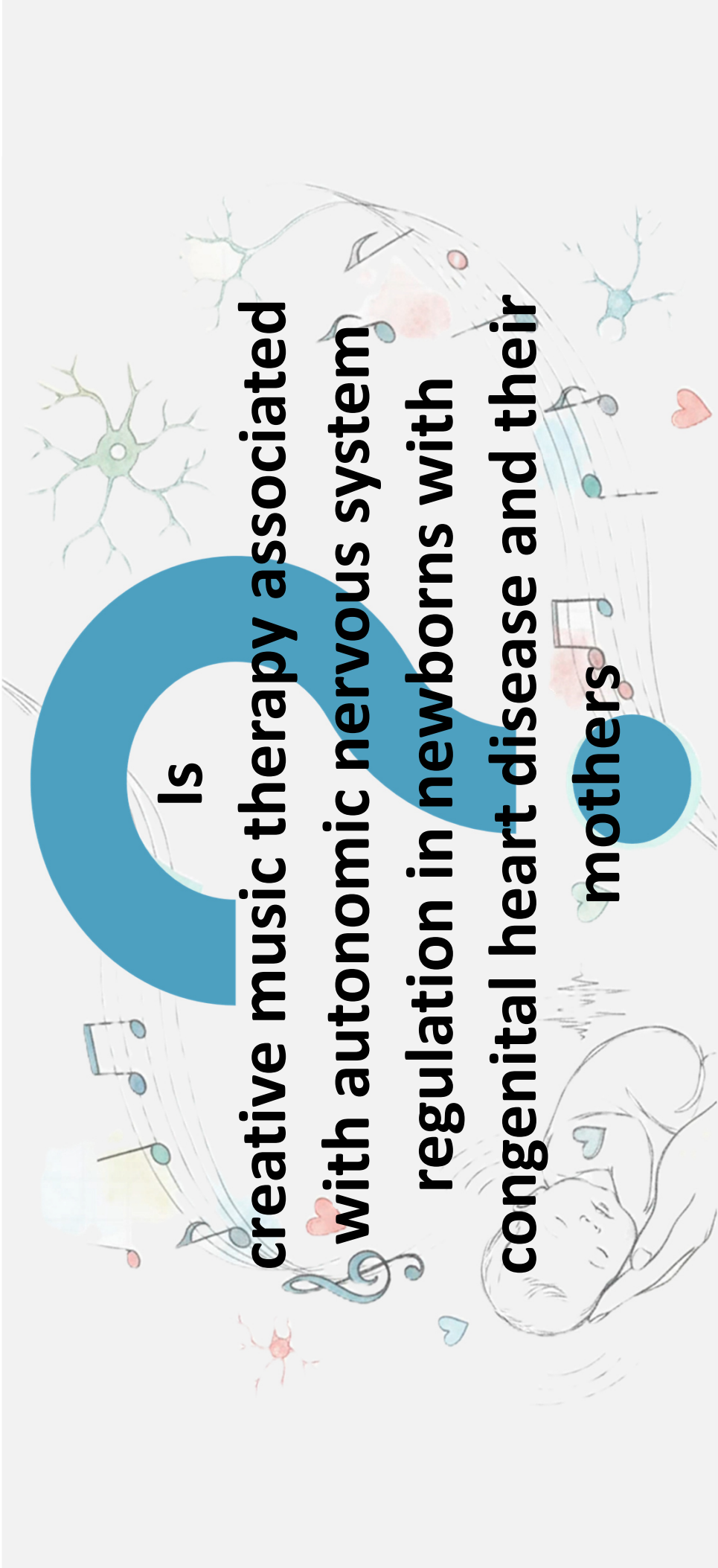


LOW HRV

A warning sign of physiological stress, impaired regulation, and **vulnerability**

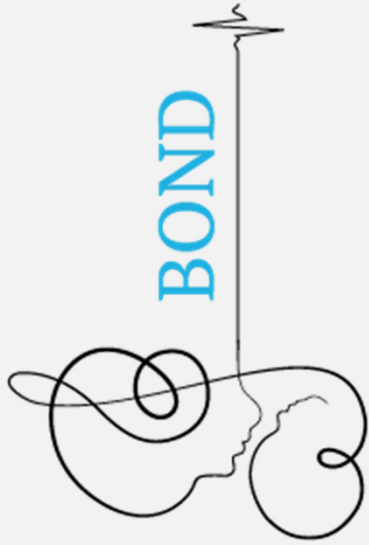
(Task Force, 1996)

AIM AND HYPOTHESIS



**Is
creative music therapy associated
with autonomic nervous system
regulation in newborns with
congenital heart disease and their
mothers**

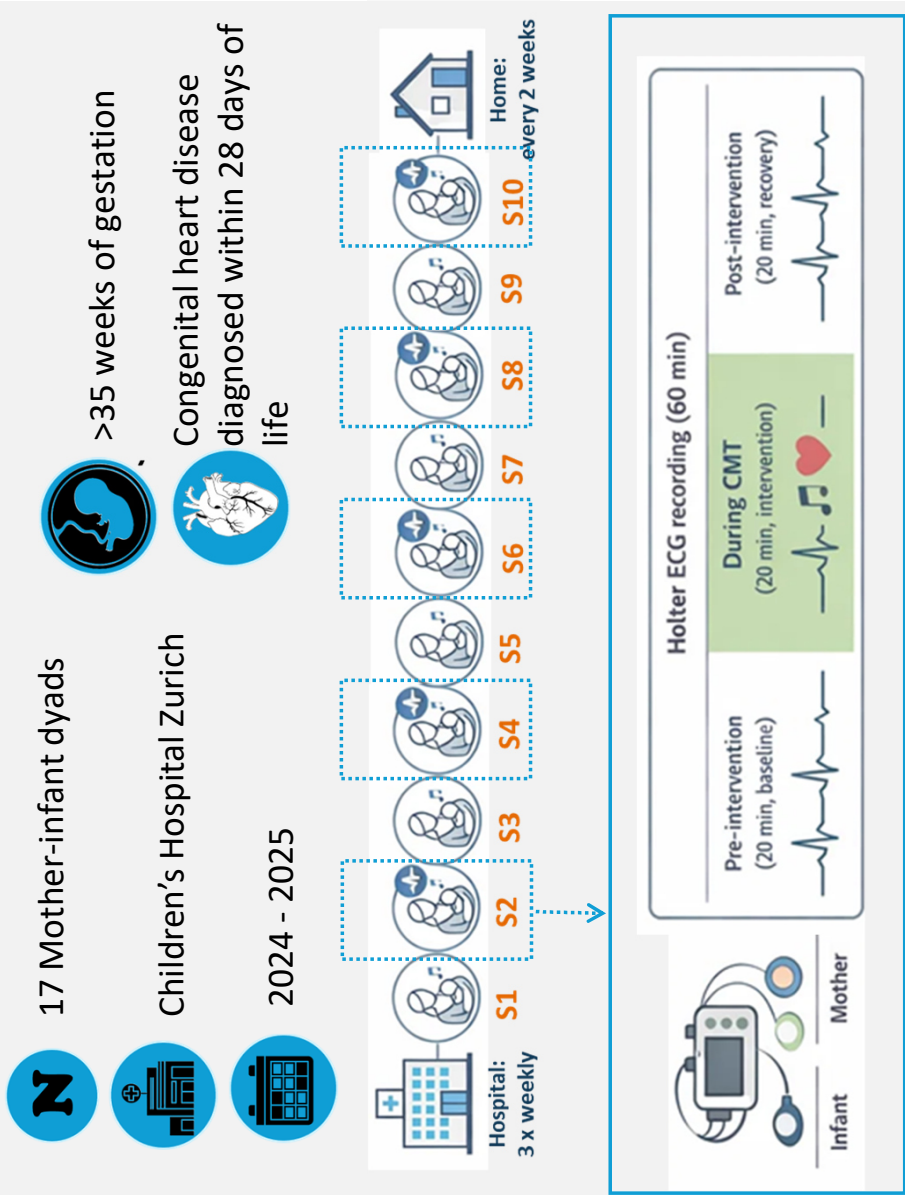
METHODS



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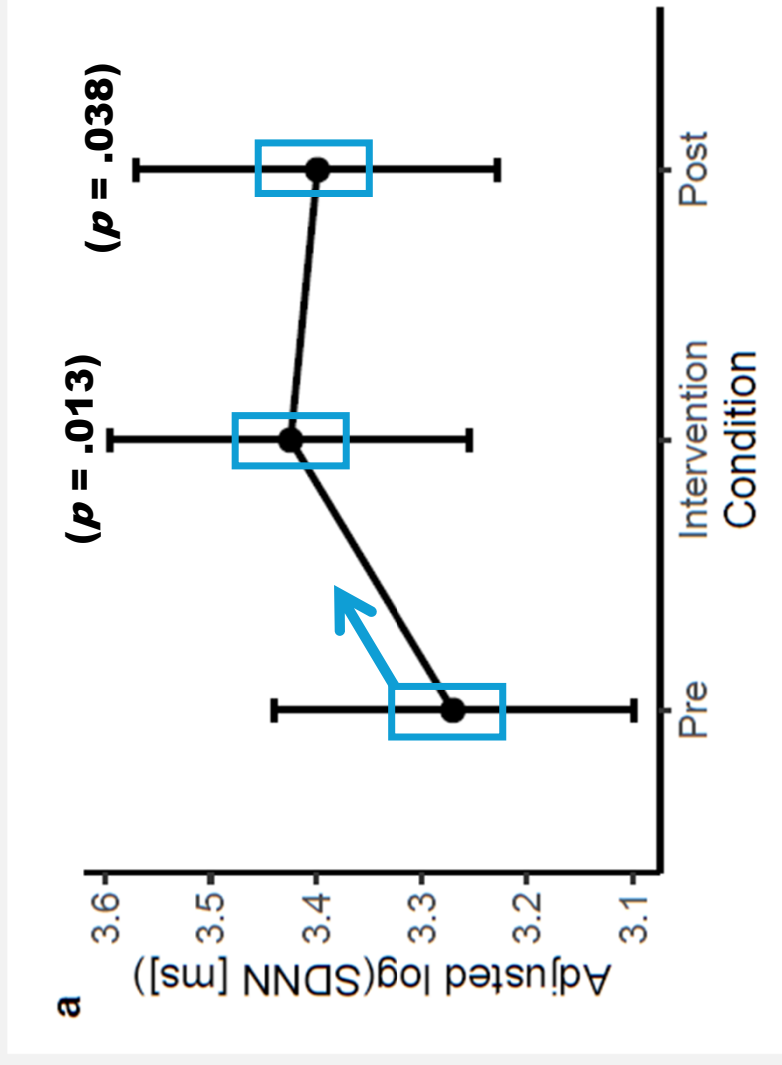
Creative Music Therapy in Newborn
Infants with Congenital Heart
Disease: a randomized controlled
study

PI: Prof. Dr. Cornelia Hagmann
01.03.2023 – 28.02.2030



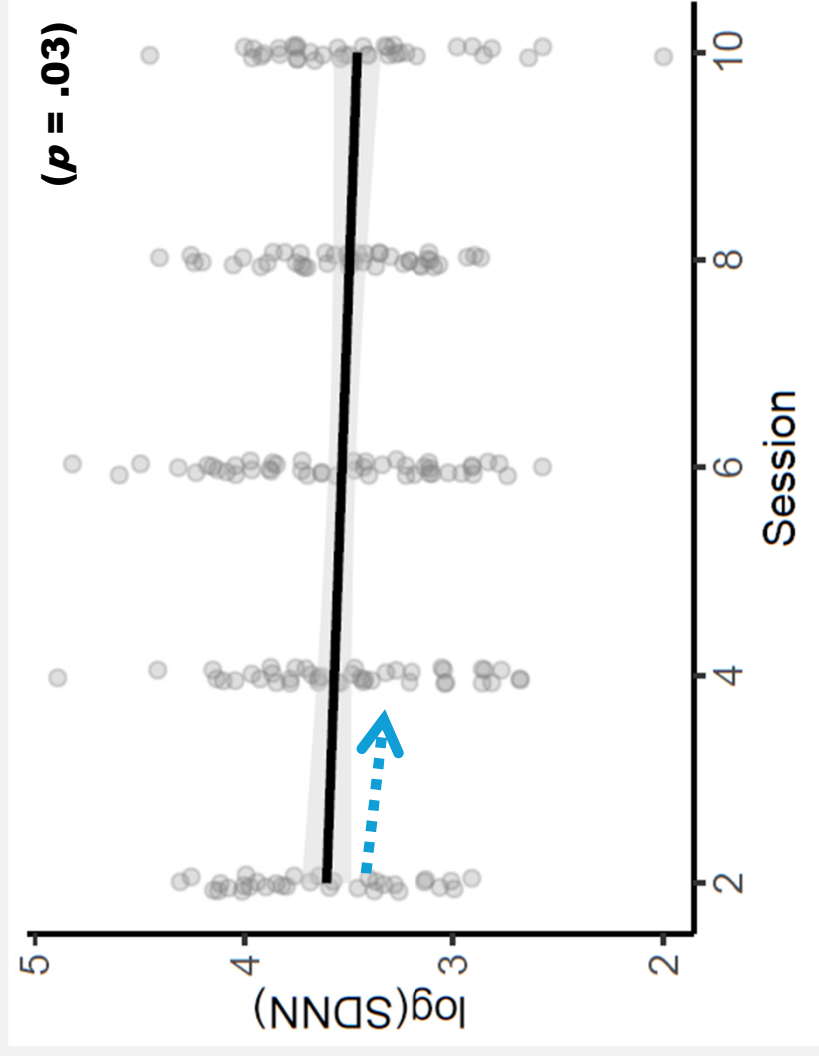
RESULTS

Newborns heart rate variability during creative music therapy



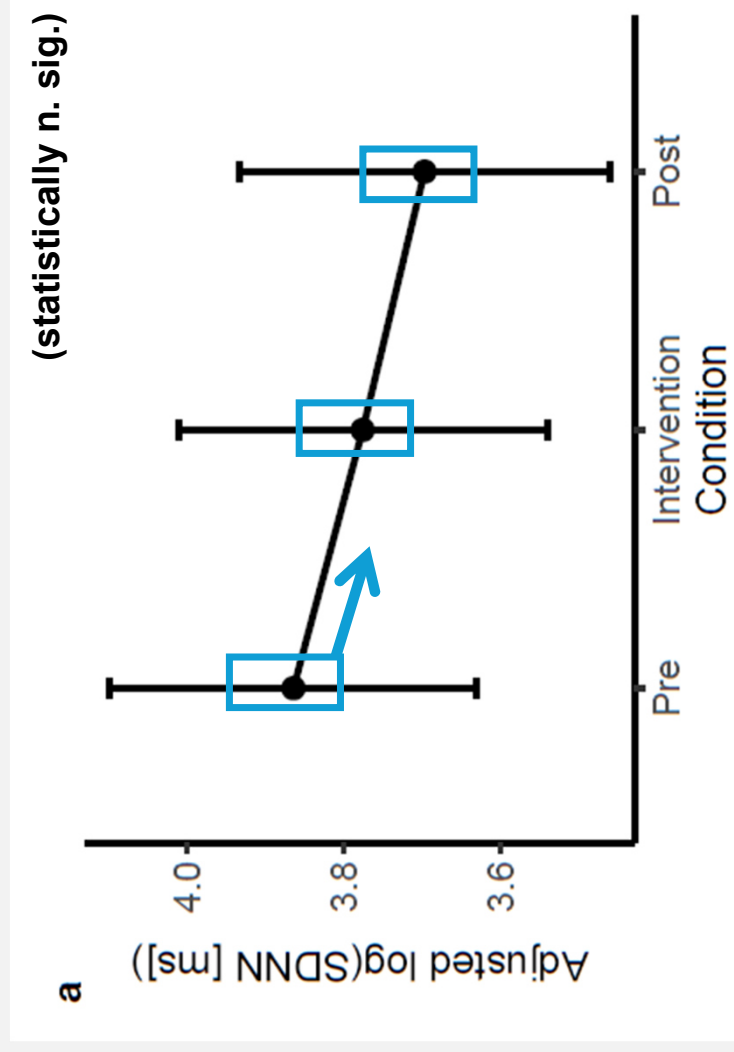
RESULTS

Newborns heart rate variability across sessions



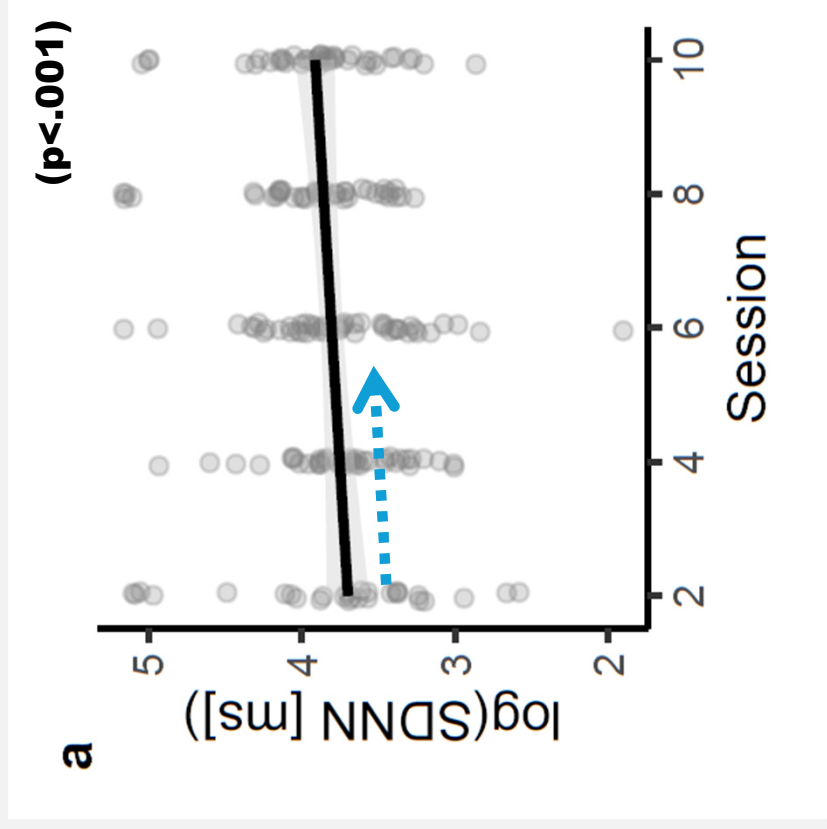
RESULTS

Mothers heart rate variability during creative music therapy



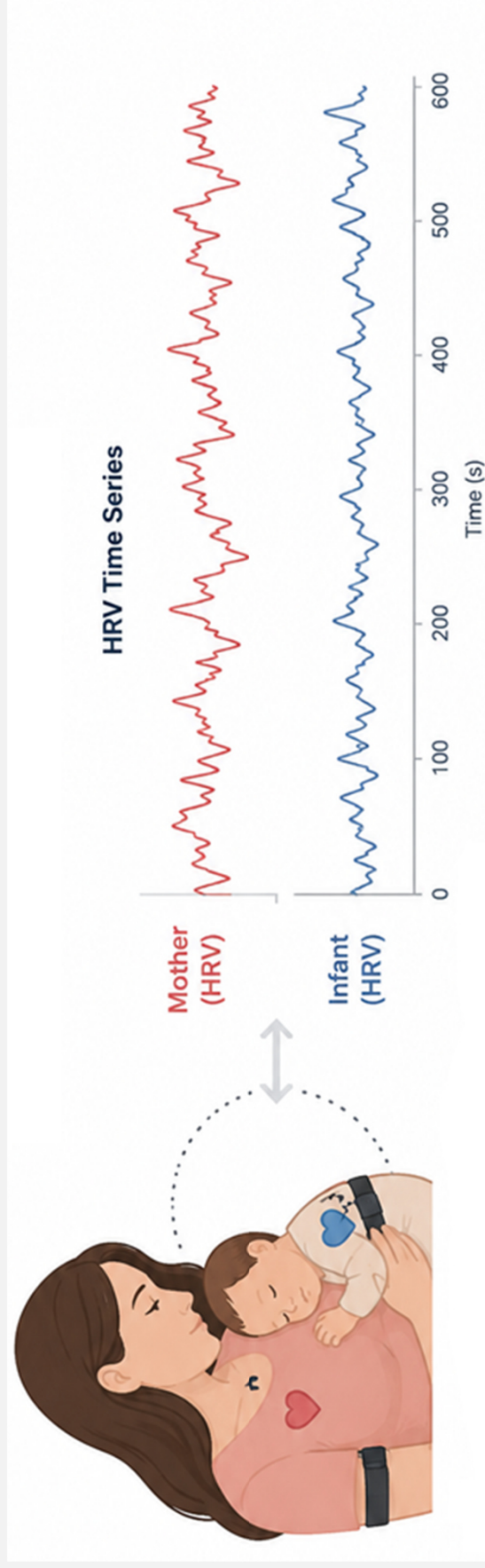
RESULTS

Mothers heart rate variability across sessions



RESULTS

Mother-Infant heart rate variability synchrony



No statistically significant HRV synchronization between mothers and infants

DISCUSSION

	Newborns	Mothers
Short-term reaction	Autonomous stabilization	Active emotional engagement
Long-term HRV-development	Decreasing trend (need for clarification)	Increasing trend (stress reduction)
Role in the session	Recipient of reassurance	Attentive, active participant

Co-Regulation complexity of dyadic physiology (non-linear interactions)

DISCUSSION

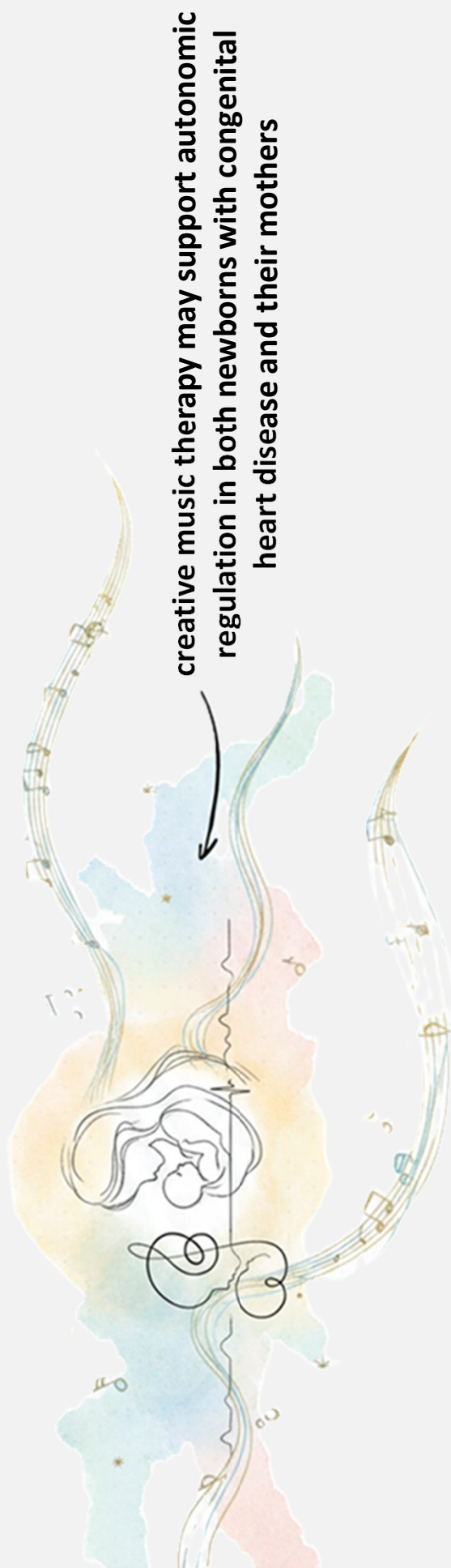
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DISCUSSION

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Co-Regulation	complexity of dyadic physiology (non-linear interactions)	

CONCLUSION



creative music therapy may support autonomic
regulation in both newborns with congenital
heart disease and their mothers

Thank you
Vithusan Somasundaram

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