

**How Heart:Breath Ratios Vary During Movement, Music, and Speech**  
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This research seeks to establish the validity of the purported developmental changes in one's heart/breath ratio and the influence of carefully planned educational activities on that ratio. The theory of the relationship between heart rate and respiration cycle as well as its significance for cognitive development derives from Rudolf Steiner's (1919) conceptualization of the mind-body connection during development. While currently underexplored in psychological research, the mind-body connection is relevant to educational styles that emphasize psychosomatic exercises and activities.

In this ongoing study, the heart rate and respiration of ten participants across four age groups (4, 10, 14, & 20 years) are recorded during 30-minute sessions. Heart rate and breathing measures are recorded using a wireless Biopac system with sensors placed on the arm of the participant and a respiration band on the chest. During these sessions, five activities take place: introductory conversation, rhythmic action, listening to live music, rhythmically walking to spoken-word poetry, and listening to a story read aloud. Baseline heart rate and breathing measures are taken during the first and last activities, while the three middle activities are designed to influence heart rhythms.

This study has two hypotheses. The first hypothesis is that heart rate and respiratory cycles will change during development and move towards a ratio of 4:1 as age increases. The second is that throughout development, individuals can move towards the ideal ratio by participating in activities that create rhythms appropriate for one's developmental stage.

The outcome of our research should have far-reaching influences across psychology, integrative medicine, and education. Given that evidence is found to support the hypotheses stated above, a new and important understanding of development and the best modes of education for children will be achieved.