

The Effects of Prenatal Music Experiences on
One-Week-Old Infants' Timbre Discrimination of
Selected Auditory Stimuli

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The purpose of this study was to determine the effects of prenatal music experiences, specifically a single music timbre, on one-week old infants' discrimination of a timbre heard prenatally and timbres not heard prenatally. Music timbres included in this study were alto voice, clarinet, trumpet, and violin. The researcher used fundamental frequencies between 261.63 Hz and 523.25 Hz and the aforementioned music timbres during prenatal and postnatal experiences to determine infant timbre discrimination. The primary research question was as follows. Can one-week-old infants discriminate between a music timbre heard prenatally and music timbres not heard prenatally? Discrimination was measured by changes in infant heart rate. Based on previous prenatal research, the assumption was that infant heart rate would decrease when infants recognized the timbre that was heard prenatally.

There were five groups of infants in this study. Four groups of infants were exposed prenatally to one of the aforementioned music timbre stimuli and served as the experimental group (n = 14). One group of infants with no prenatal exposure to the music timbre stimuli served as the control group (n = 12). Additionally, effects of other variables on infant timbre discrimination were examined, including the number of hours of exposure to the music timbre stimulus, other music exposure during the third trimester, Apgar scores at 1 and 5 minutes, gestational age at the week of delivery, birth weight, gender, age of infant when tested, and presentation order of the music timbres.

Seven of the fourteen infants in the experimental music timbre groups were able to discriminate between their prenatal music timbre and the timbres not heard prenatally. Of the 14 infants in the experimental group, 57% responded to the alto voice timbre, as measured by a decline in heart rate means.

Approximately 50% of the infants in the experimental group responded to both the violin and trumpet timbres, as measured by a decline in heart rate means.

Only 28% responded to the clarinet timbre, as measured by a decline in heart rate means. Of the 12 infants in the control group, 75% responded to both the alto voice and clarinet timbres, as measured by a decline in heart rate means. Forty-two percent of the control group infants responded to the violin timbre, and 33% responded to the trumpet timbre, as measured by a decline in heart rate means.

The effects of other factors on infants' heart rate responses to the music timbre also were examined. In this study, the factors that affected infant timbre discrimination of the experimental group included the number of hours of prenatal exposure to the music timbre stimulus, birth weight, gender, the age of the infant when tested, and presentation

order. Factors that did not affect infant timbre discrimination in this study were the number of hours of prenatal exposure to other music, Apgar scores, and gestational age. The effects of other factors on control group infants' heart rate responses to the music timbres also were examined. In this study, one factor that affected infant responses to music timbres was the presentation order of the music timbres. Other factors that possibly affected control group infant responses to music timbres were birth weight and gender. Factors, in this study, that did not affect control group infants' responses to music timbres included Apgar scores, gestational age, and the age of the infant when tested. Due to the small number of infants in the control group who were exposed to other music prenatally, it was unclear if exposure to other music prenatally had any affect on infant responses to the music timbres.