

After all, we are not metronomes: A study on stability of tempo perception

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The major purpose of this study was to determine whether listeners are capable of forming judgments, with respect to the right tempo of specific musical examples, that remain stable over a period of time. The question Do listeners possess a concept of right tempo for a piece of music, and if so, is this concept consistent? is the main theme of this study. But there is also a second question, more difficult to answer, that underlines its intent: Do listeners possess a time sense—a timing ability for the proper pacing of time—which enables them to render stable tempo judgments over a period of time? In addition, it was of interest to examine what factors might affect listeners ability to give evidence of temporal consistency. The factors explored were age, musical background, stimulus style/genre, familiarity, and preference.

More specifically, the study was designed to explore the way listeners ($n=90$) from different age groups and musical backgrounds (musicians and nonmusicians) perceive how particular pieces should sound in their right tempo, and whether their conception of right tempo is represented in their mind as a stable musical entity like pitch at repeated listening tasks over a period of time. By means of digital technology, listeners just by saying faster or slower to the experimenter, who manipulated the tempo accordingly, were enabled to examine the influence of tempo on the way the music sounded, until they came to a point when the music sounded right to them.

The right tempo has been considered as a perceptual unifying construct of music whose function is the meaningful (rightful) synthesis of finite juxtaposed musical elements in relation to real time. In this light, one might say that selecting the right tempo is an instance of the process of making sense-or constructing the meaning(s)-of a composition, with the compositions tempo serving as a musical point of reference.

Results indicated that the initial tempo of significantly dominated subjects right tempo judgments: the slower initial tempo generally evoked slower tempo selections, and so on. However, a relatively small number of adults, mostly musicians, were remarkably consistent in their tempo judgments across all four trials. It appeared that these individuals possess an exceptional ability with respect to acute stability of large-scale timing in music. It was suggested that the ability to give consistent tempo judgments over time to a piece of music in conditions seemingly devoid of an external tempo reference (a score or the body interaction involved in performance) may be referred to as absolute tempo, analogous to absolute pitch.

There was also evidence that the degree of consistency in right tempo judgments gradually increased from preadolescence through adulthood. Few statistically significant differences in consistency of tempo judgments were found as a result of musical background. Findings strongly suggest that the style of the musical examples influenced the degree of tempo consistency across trials. Indeed, it becomes obvious that individual innate structural characteristics of the styles facilitate listeners to extract criteria for determining the right tempo of the particular musical examples. Moreover, there was statistically significant evidence that an increase of familiarity with the musical examples and the musical styles resulted in an increase of consistency of right tempo judgments.

It is hoped that if we consider the musical parameter of tempo as a new point of reference by using advanced technological tools this will attract our attention to the pace of musical time and, thus, open a new and intriguing dimension for listening. In this context, the finding that most listeners did not prove to be precisely consistent in their right tempo judgments over a period of time becomes a secondary issue. Indeed we all vary in the abilities with which our aesthetic perceptions operate. After all, we are not metronomes.