

Chin force in violin playing

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The aims of the present study were to develop a chinrest that could directly assess chinrest force during musical performance and to provide baseline force data. A force transducer-mounted chinrest was designed and built by the present authors. Data were obtained from 11 elite violinists while they performed scale tasks at different dynamics (*p*, *mf*, and *f*), tempi (1, 4, and 8 Hz), and hand positions (first and eighth). Data were also obtained from playing the tasks with vibrato, and the excerpts were from the Bruch and Dvorak concertos. A mechanical test of the chinrest confirmed good linearity of the force up to 100 N. During the scale tasks, chinrest force was around 14 N at *p*, which increased to 18 N at *f*. Neither the playing tempo nor the hand position largely affected the force, but it was significantly increased during vibrato. During playing the Bruch concerto, the force was elevated to 28 N (peak force=39 N; the peak-force range in all players=26-76 N). Typical chinrest force to stabilize the violin during ordinary musical performance is thus less than 20 N, but it can be tripled or more when performing technically demanding musical tasks.

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