COLLEGE OF ARTS, HUMANITIES & SOCIAL SCIENCES
THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

Research Horizons Day & Research Week April 6-13, 2018

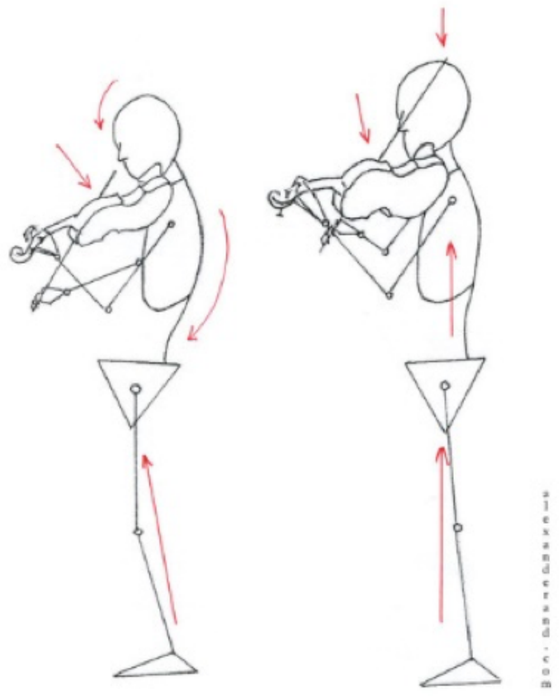
Research Horizons Day

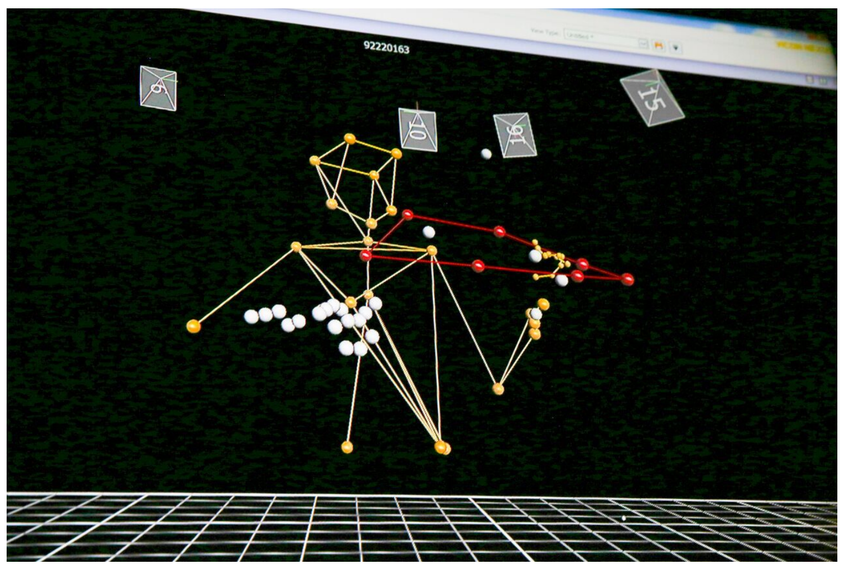
Measuring the Effects of the Alexander Technique on Posture and Tension in Violinists and Violists Using Motion Capture Technology

Rebekah Frederick, Shannon Mathis, and Brian Landrum
Depts. of Music, Mechanical and Aerospace Engineering, and Kinesiology

Background

- **Musicians** often experience overuse injuries due to the repetitive movements they perform while playing and these injuries can be worsened by poor posture.
- **The purpose** of this study was to investigate possibilities that could help violinists and violists combat postural imbalances that may occur due to the position of the instrument.
- **Using** the instruction of the Alexander Technique (AT), a method of movement that focuses on lengthening the spine and guiding the body into natural alignment, this study tracked the movement of violinists and violists before and after they experienced the AT.





Methodology

- **Motion-capture technology** was used to track the movement of student violinists and violists as they played a short piece of music.
- **Reflective beads** affixed to anatomical land marks allowed the spaces between those areas to be measured to see if the AT changed the shoulder or head positions of the musicians.
- **Participants** would first rank their own pain and tension, then be tracked by the cameras as they played a short etude. **Next,** the participants would watch an instructional video on the AT and replay the same etude while applying what they learned. **Afterwards,** the participants re-took the same questionnaire raking their pain and tension.
- **Angular displacements** of the head, neck and shoulders were measured to quantify changes in body posture.

Results

- **There was** a statistically significant increase between the pre- and post-AT measurement of the distance between the reflective markers placed at the mandibular angle (M = 149.39 SD = 16.74) and acromion process (M = 154.16, SD = 18.88), (t = 4.36, p = .01).
- **There was no** statistically significant difference between the pre- and post-AT measurement of the mean distance between the reflective markers placed at the C3 spinous process (M = 117.96, SD = 17.08) and the occipital bone (M = 126.5, SD = 11.36), (t = 2.02, p = .30).

Conclusions

- **The results** of the study indicate that the AT produced a measurable change in the participants' body position while they played their instrument.
- **The increase** in length seen between the left acromion process and left mandibular angle indicates that the AT has the potential to help players either combat jaw compression against their instrument, or to enhance relaxation through the left shoulder.
- **While** the thesis was not proved in the area of the C3 spinous process and left occipital bone, mean distances were altered, thus indicating that the AT did affect the length of space between these two points—just in the opposite direction expected—and could still serve to enhance relaxation.

Acknowledgements

Many thanks to Andrew Creech, Madhu Sridhar, Dr. Barbara Hudson, Dr. Ryan Connors, Alex and Darnisha, and Zella Brown and Shatura Hall. Also, many thanks to Dr. Shannon Mathis for her assistance with data calculations and interpretation, and Dr. Brian Landrum for setting up and facilitating the study.