

Body Mapping for Singing Balance: A Quantitative Study

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PURPOSE

To systematically examine the effectiveness of the Body Mapping (BMG) method of posture instruction. This study also examined whether or not there was an association between posture and breath capacity while singing.

HYPOTHESES/RESEARCH QUESTIONS

- Will the experimental group show better alignment of the Atlanto-Occipital joint (and subsequent places of balance) than the control group?
- Will better postural alignment correspond with greater breath capacity while standing and also while singing?

POPULATION/SAMPLE

49 undergraduate adult students attending the University of North Dakota

- Control Group: 15 sopranos, 10 tenors
- Experimental Group: 15 altos, 9 basses

METHODOLOGY

- All participants had pre-test measurements taken of their postural alignment.
- Participants were randomly distributed into control and experimental groups.
 - Each group received six 15-minute sessions of postural instruction on the six places of dynamic balance (Atlanto-Occipital joint, shoulder joints, lumbar region, hip joints, knee joints, ankle joints).
 - Control group received only basic verbal instruction.
 - Experimental group received Body Mapping instruction.
- All participants had posttest measurements taken of their postural alignment.

DATA COLLECTION

- The Vicon motion capture system (UND Kinesiology department)
 - Individual markers are placed at strategic locations
 - Cameras capture high-speed images of the markers for a complete 3D representation of movements
 - Data from these images are calculated into angular measurements
- Participants wore fitted clothing and the 35 markers were attached.
- A total of 4 trials were completed:
 - Standing in a static (still) ready position for 20 seconds
 - Three separate trials of singing "Happy Birthday" in a range that felt comfortable for their voices
- Data from the 6 places of dynamic balance and lower costal regions of the ribs were selected for statistical analysis.

RESULTS

- Direct comparison: Improved static alignment of the lumbar region for the experimental group as compared to the control group
- Change over time:
 - Significant A/O results for the experimental group
 - Significant static lumbar results for both groups
- Composite analysis: Improved alignment for the experimental group
- Breath analysis: Measurable improvement for the entire sample

FURTHER STUDY

- More and longer instructional treatment sessions
- Use of the full BMG course as the instructional treatment
- Individual participants in a one-on-one setting
- A larger sample; a purposefully homogeneous sample
- Specific focus on breath activity and measurement
- Measure effectiveness based on pitch, tone, or other acoustic characteristics

Moreno, A. M. (2022). *An Examination of the Effects of Body Mapping Instruction on Singers' Static Standing Posture and Posture While Singing* (Order No. 29168786). Available from ProQuest Dissertations & Theses A&I; ProQuest Dissertations & Theses Global. (2682732045).
<https://www.proquest.com/dissertations-theses/examination-effects-body-mapping-instruction-on/docview/2682732045/se-2>

Experimental Lesson 1: The Atlanto-Occipital Joint

Black text = the script, to be delivered by the conducting assistant

Red text = refer to an image, diagram, or video

Blue text = provide a live/personal demonstration

These sessions will be dedicated to learning elements of the Body Mapping method and how to apply them to singing. I'd like to begin by giving a few brief definitions.

- The Body Mapping method is the conscious correcting and refining of one's Body Mapping to produce efficient, graceful, coordinated, effective movement.
- The body map is the literal neuronal picture individuals have in the brain that dictates human movement. This map changes over time through physical development, injury, and healing.
- Kinesthesia is a person's perception of the body's movement and position in space.

In these sessions, we're going to talk about 6 Places of Dynamic Balance in the human body. Understanding these places can help a person to experience better posture. Today, we will discuss the first of those places: the Atlanto-Occipital joint, or the AO joint. This joint is where your skull meets the top of your spine.

(Teacher points to the location on their own body.)

Take a moment to consider where this joint is in your own body. Feel free to move your head and shoulders as you do this.

Wait for a moment.

Now, consider your skull - its shape, its size, and the weight of your head including the brain.

Wait for a moment.

Take a look at this image to see if it is different from what you thought.

(Show Image 1)

Take a look also at this model to gain a clearer idea of the three-dimensional nature of your skull.

(Hold up skull model)

The weight of the head is roughly 10-12 pounds. This weight is delivered through the front of the spine. The front of the spine also supports the weight of the head. Was there any difference between these visuals and the information in your body map?

Allow 1-2 participants to verbally respond.

Next, consider the vertebra at the very top of your spine.

Wait for a moment.

Here is an image of the atlas, or the C1 vertebra, which is the topmost bone in your spine.

(Show Image 2)

The connection of the C1 vertebra with the base of the skull, or the occiput, creates the Atlanto-Occipital joint, or the AO joint. Here is an image of that joint.

(Show Image 3)

And here is the model showing that joint.

(Hold up the skull and vertebrae to demonstrate 3D connection)

How does this visual compare with the information in your body map? Was there a difference in size? Shape? Location?

Allow 1-2 participants to verbally respond.

We're going to do a few movement exercises so you can feel this in your own body. The AO joint is responsible for facilitating only a minimal amount of movement from front to back, no more than 25 degrees total.

(Demonstrate all movements while describing for participants.)

- The easiest way to imagine placement of your own A/O joint is to place your fingers below your ears and imagine a wire connecting them through the center of your head.
- Tilt your head centrally from front to back - even though the A/O joint facilitates only minimal movement, there are tons of sensory receptors in that joint.
- Look again at this image to see the central location of the joint between the front and back of your head.

(Show Image 3)

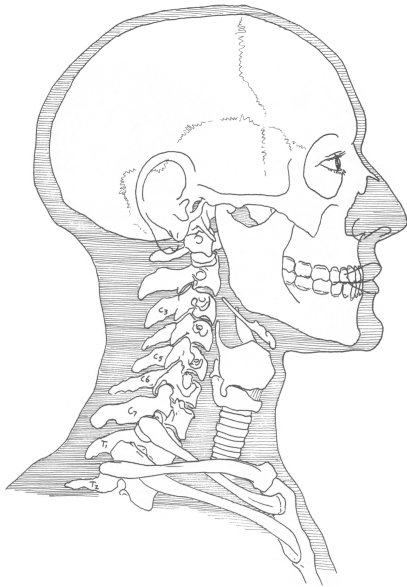
We are now going to put this knowledge to use in one of our songs. As you sing, pay attention to your AO joint, feeling the weight of your head being delivered through the front of your spine and the central location of that joint. When the head is balanced, it is not in front of the body. Additionally, the neck muscles are used for movement of the head, and not for holding it up.

Conduct group through a portion of repertoire.

Do you notice any change in your breath, your vocal output, or your posture?

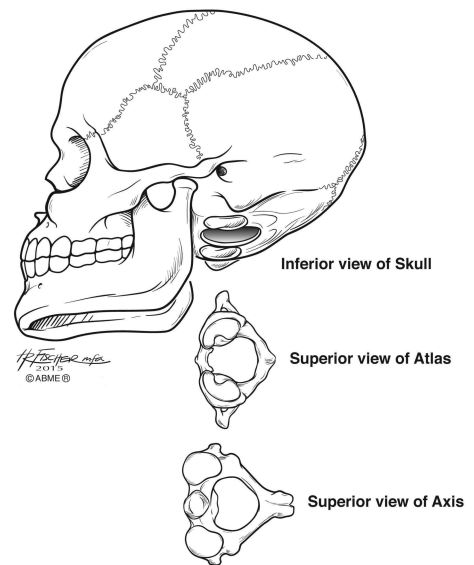
Allow 1-2 participants to verbally respond.

Experimental Lesson Image 1



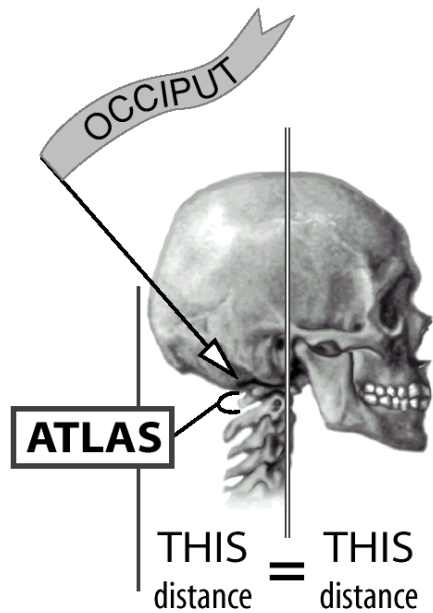
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Experimental Lesson Image 2



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Experimental Lesson Image 3



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