

Hearts, Livers, and a Whole Lot of Guessing: How Anatomical Knowledge Varies Among College Students and Why It Matters



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Background:

- Decades of research show consistently **low baseline anatomy knowledge** (Weinman et al., 2009)
- Despite **increased education** and **media exposure**, anatomy knowledge today remains **similar to the 1970s** (Weinman et al., 2009)
- Public studies reveal **poor understanding of key organs**—only 45% correctly identified the heart, 27% the liver, and 23% the prostate—structures linked to over **750,000 U.S. deaths** in 2020 (Taylor & Wessels, 2024)
- Anatomical knowledge is essential for informed **health decisions** and **public policy**
- Anatomy knowledge and attitudes toward anatomy education both increase with **education level** (Weinman et al., 2009; Moxham et al., 2016)
- Patients with less education are less likely to question providers or seek additional information (Smith et al., 2009)
- No studies have examined **college students' anatomy knowledge**, which may vary by background, athletic status, experience, or region

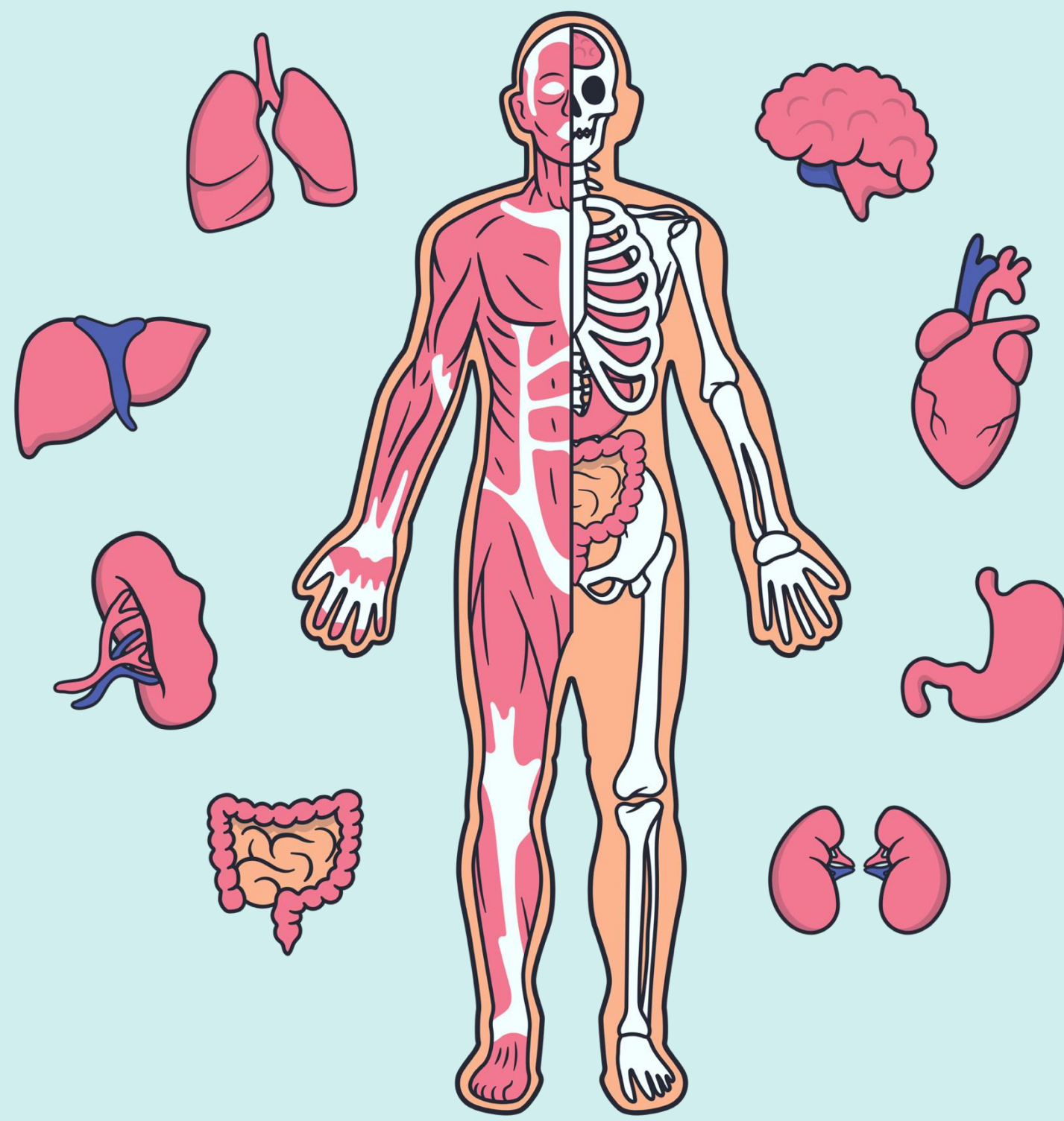


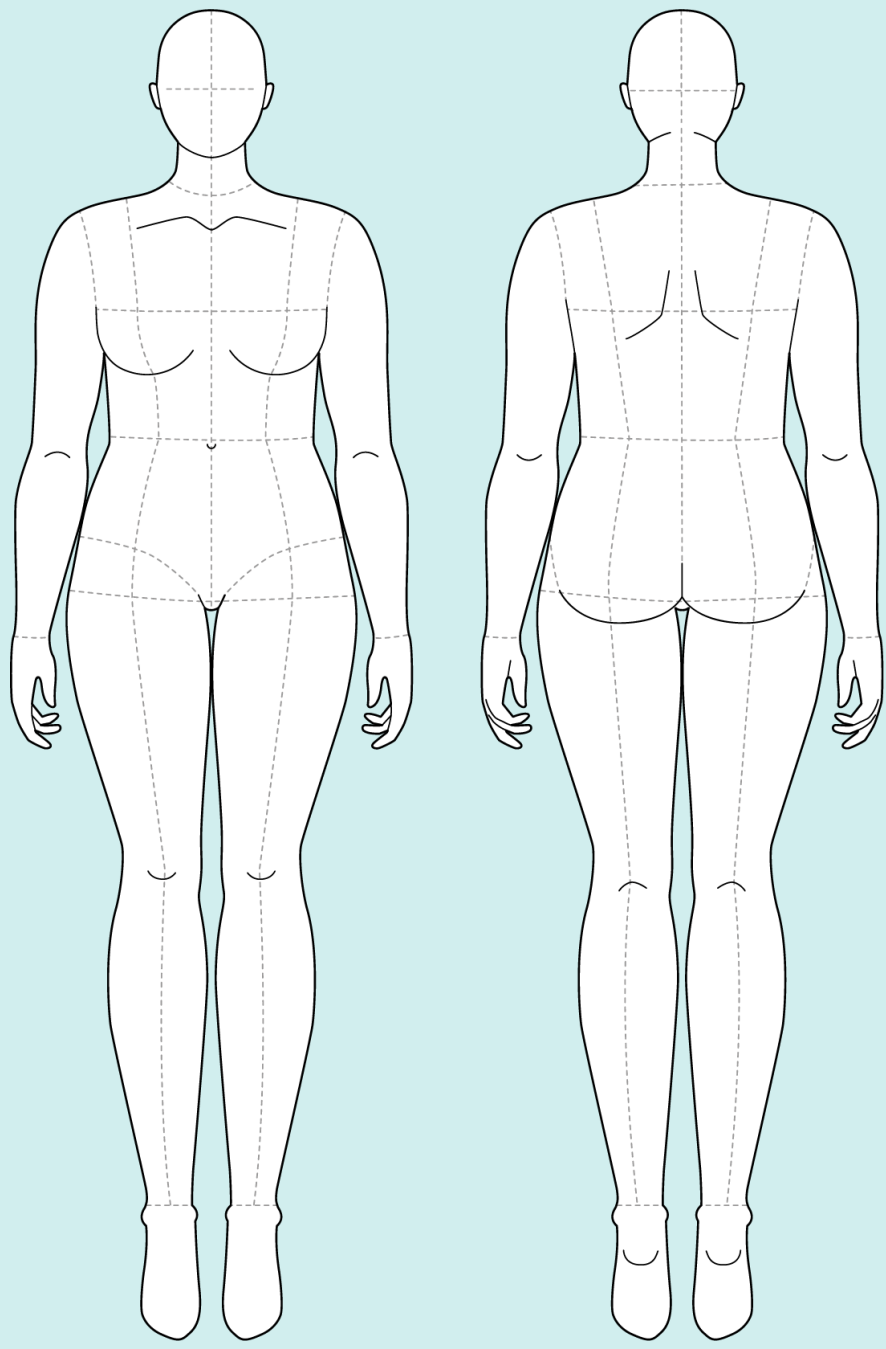
Image Credit: Monsters-Visual User on Canva

Research Question:

What demographic factors affect college students' knowledge of anatomical structures?

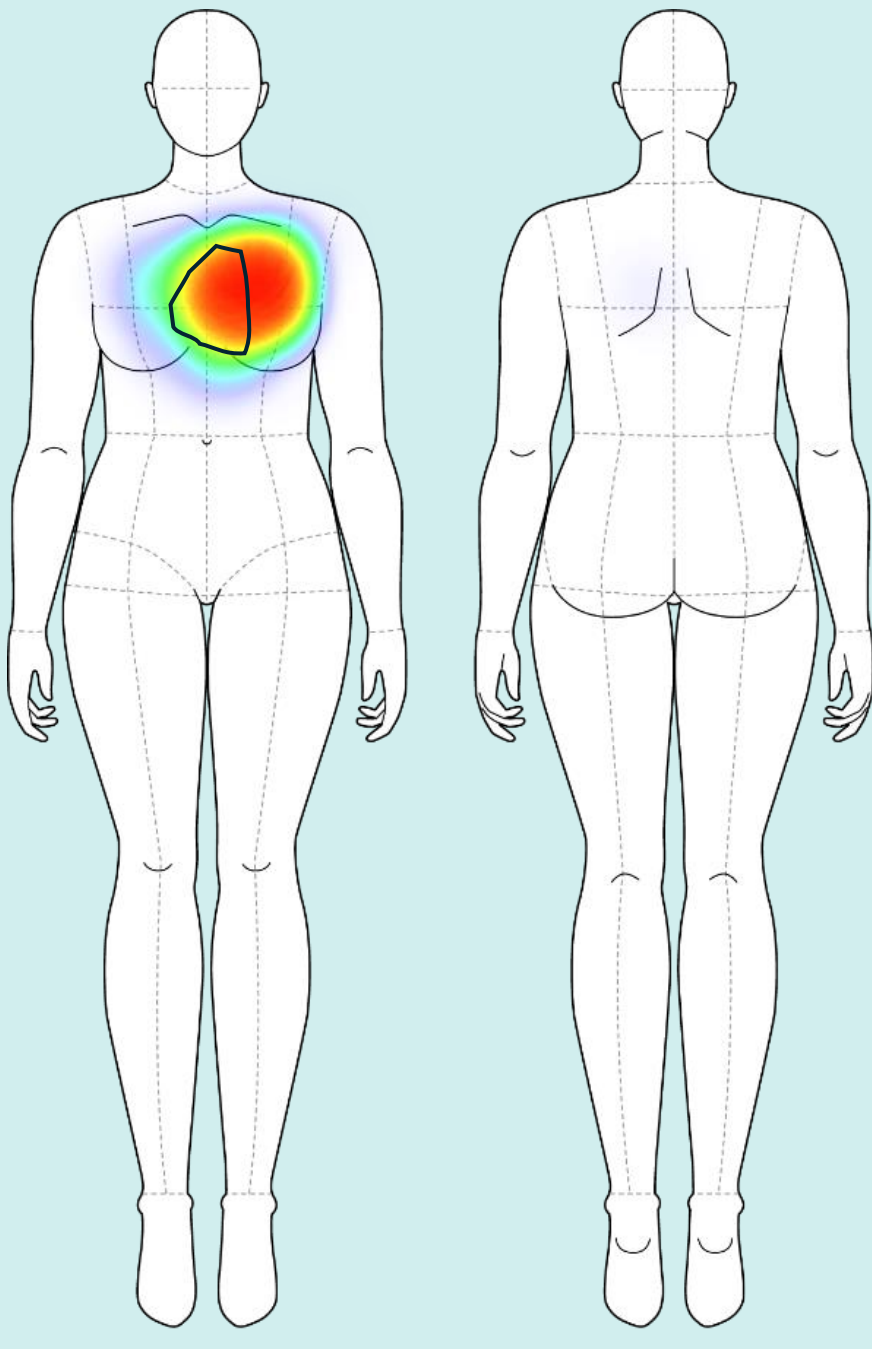
Methods: Survey Design and Administration

- A 15-minute online survey was sent out to undergraduates at Linfield University
- Participants were asked to identify:
 - 16 organs** from various systems
 - 12 musculoskeletal structures** (e.g., bones, muscles, ligaments)
- We collected demographic and background data, including participants' social identities (e.g., race, gender, sexual orientation), educational background, athletic status, health history, and engagement with media and political information sources
- Sample size = 251 students**



Front and back views of the body image shown to participants during the identification task.

Measuring Anatomical Knowledge



Example heatmap showing all student responses for the perceived location of the heart. Darker areas indicate regions where more participants clicked.

- To assess anatomical knowledge, **participants clicked** on two body images to mark where they believed each structure was located
- Hidden regions (outlined in black) corresponding to each anatomical structure were defined on the body images to objectively determine whether participant clicks were correct

Results: Organ and Musculoskeletal Structure Identification

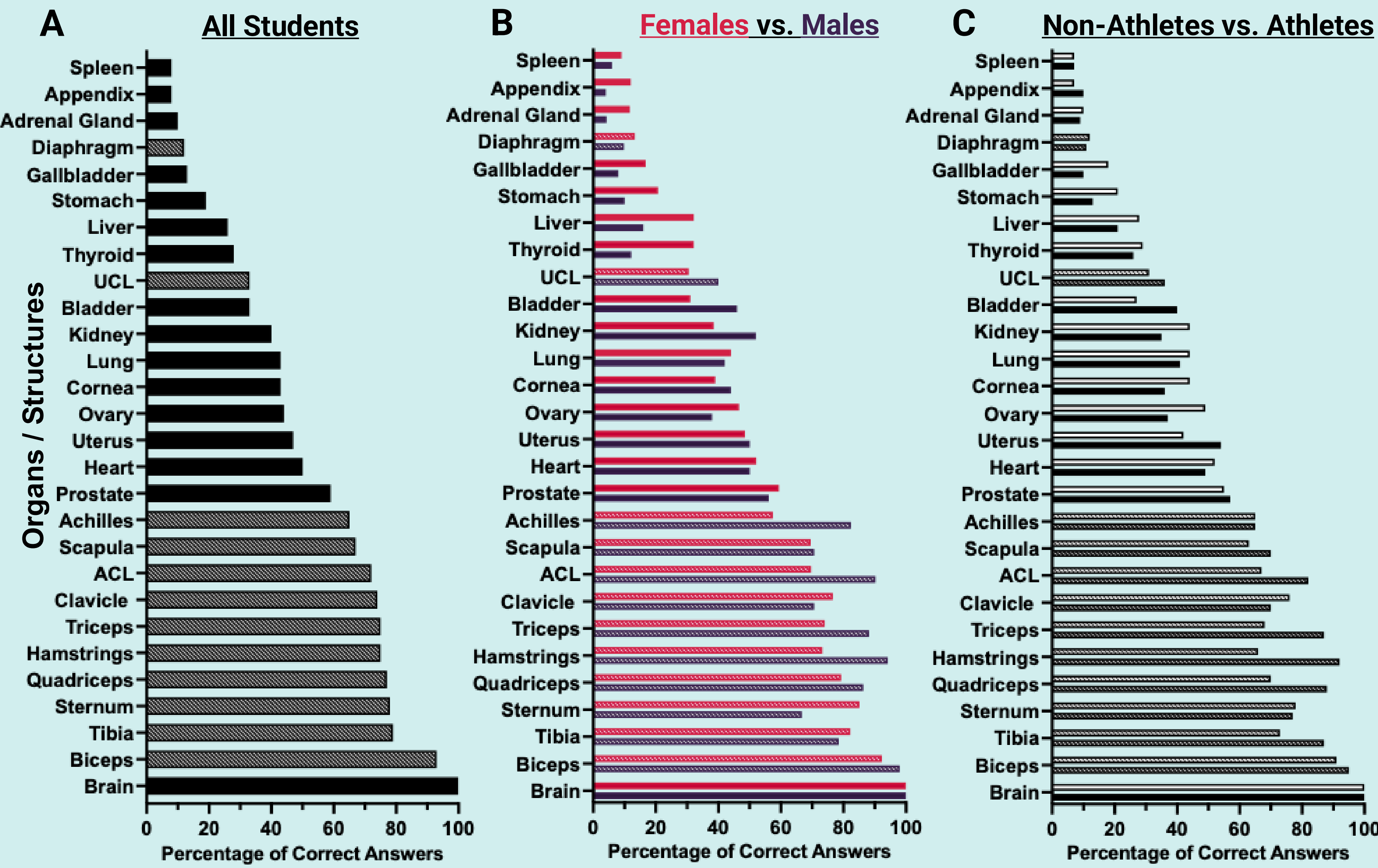


Figure 1. Bar graphs showing the percentage of correct identifications for each structure. Organs are shown with solid bars, and musculoskeletal structures are hatched. **Graph A** displays all student responses (N=251). **Graph B** compares females (red; N=169) and males (purple; N=50). **Graph C** compares non-athletes (white; N=143) and athletes (black; N=82).

Conclusions & Future Directions:

- Students in general have a better understanding of musculoskeletal structures than organs
- Female students** generally have **higher knowledge** of **organ locations**, while **male students** tend to have **higher knowledge** of **musculoskeletal structures**.
- Athletes** generally have **higher knowledge** of **musculoskeletal structures** than non-athletes.
- Next:** Analyze results to find other predictors of anatomy knowledge
- Next:** Continue sampling at Linfield and broaden to other colleges

Results: Heatmaps

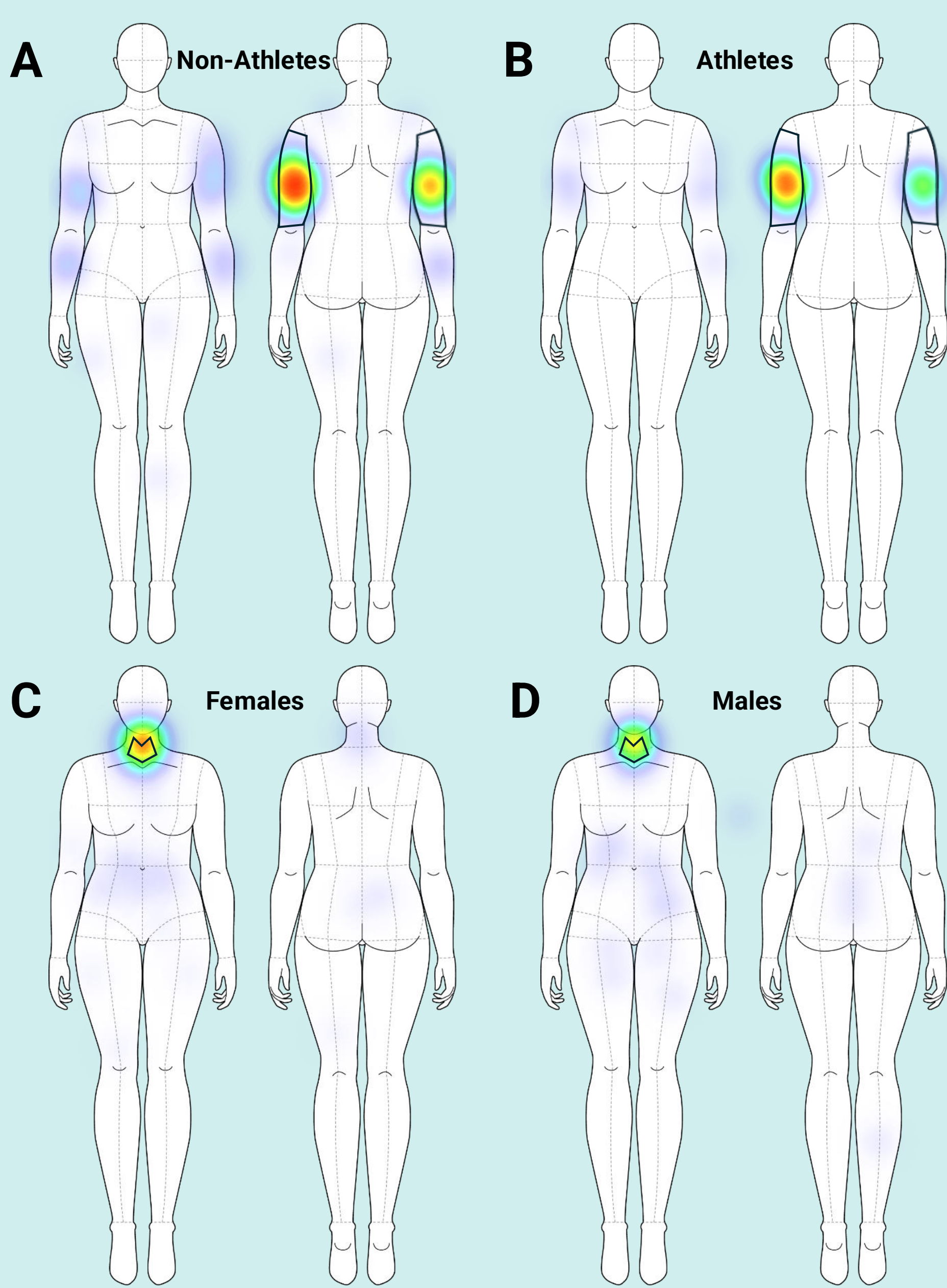


Figure 2. Heatmaps showing participant click locations when identifying anatomical structures. Correct locations are outlined in black. (A–B) Triceps identification among Non-Athletes vs. Athletes. (C–D) Thyroid identification among Females vs. Males.

Acknowledgements:

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