Current Practices in Physical Anthropology for Sex Estimation in Unidentified, Adult Individuals

Alexandra R. Klales, MS

Doctoral Candidate, University of Manitoba

Visiting Assistant Instructor, Dickinson College

Research Questions

- What are the current practices and preferences of physical anthropologists for sex estimation in unidentified, adult individuals encountered in forensic and bioarchaeological contexts?
- To what extent are sex estimation practices standardized within the field of physical anthropology?

Goal

"to raise awareness of our practices as a unified discipline and promote discussion on future improvements and standardization"

(Garvin & Passalacqua 2012 pg.427 for adult age estimation survey)

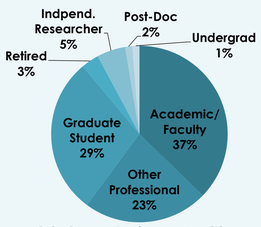
Materials & Methods

- 32 question electronic online survey
  - concerning respondent's education, background, & preferences for sex estimation
- Participants recruited via email based on their membership in professional anthropology organizations
- 152 respondents

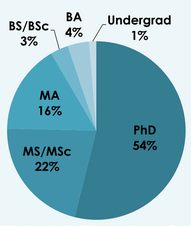
Results

Education & Current Position

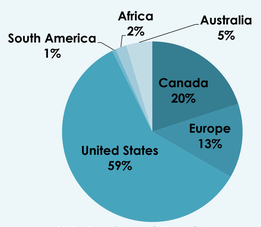
- Most respondents were academic or professional physical anthropologists with advanced degrees in anthropology that are mostly based in North America. 40.5% were also AAPA members.



Q4: Current Primary Position



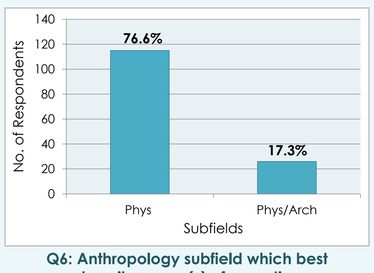
Q2: Highest Anthropology Degree



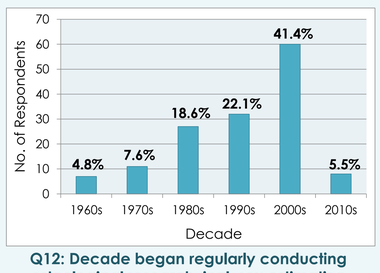
Q5: Region of Employment

Experience

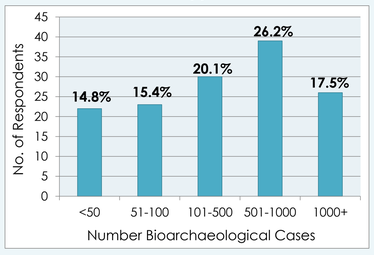
- 65.6% self identified as bioarchaeologists
- 60.9% self identified as forensic anthropologists



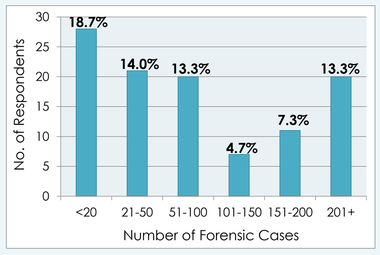
Q6: Anthropology subfield which best describes area(s) of expertise



Q12: Decade began regularly conducting osteological research, incl. sex estimation



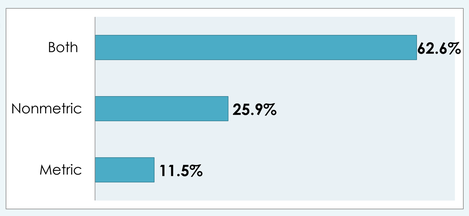
Q13: No. of BioArch cases conducted osteological reconstruction, incl. sex estimation



Q14: No. of ForAnth cases conducted osteological reconstruction, incl. sex estimation

Methodological Preference

- Nonmetric methods preferred 2.25:1 to metric methods when both types are not used for sex estimation



Skeletal Region Preference

- Respondents ranked the skull, pelvis, long bones, and the hands and feet, based on their preference and perceived reliability of those areas for sex estimation when the skeleton was complete or nearly complete.
- Pelvis ranked highest (89.8%) as most preferred region
- Skull ranked second (2.2 average rank) most preferred area, followed by the long bones (2.9 average rank)

Region	First	Second	Third	Fourth	Fifth	Don't Use	Average Rank
Pelvis	123	10	0	0	4	0	1.2
Skull	10	94	29	3	0	1	2.2
Long Bones	0	27	98	8	0	4	2.9
Hands/Feet	3	1	3	80	41	9	4.2
Other	2	4	1	30	47	53	4.4

First = most preferred or used skeletal region, fifth = least preferred or used skeletal region

Pelvis Preferences

- Metric: FORDISC
- Nonmetric: Phenice's three traits (54.5% 1st choice)

Source	First	Second	Third	Fourth	Fifth	Sixth	Average Rank
Phenice (1969)	61	26	16	5	2	2	1.8
Buikstra & Ubelaker (1994)	35	50	21	2	5	2	2.0
Krogman & Iscan (1986)	5	11	29	38	10	1	3.4
Rogers & Saunders (1994)	7	17	19	24	13	7	3.5
Partuition Scars	3	8	11	10	34	9	4.2

Skull Preferences

- Metric: FORDISC
- Nonmetric: Buikstra & Ubelaker (59.7% 1st choice)

Source	First	Second	Third	Fourth	Fifth	Sixth	Average Rank
Buikstra & Ubelaker (1994)	71	32	10	5	1	0	1.6
Walker (2008)	23	42	20	8	5	2	2.4
Williams & Rogers (2006)	9	10	23	15	23	2	3.5
Krogman & Iscan (1986)	6	11	31	31	12	4	3.5
Ascadi & Nemeskeri (1970)	2	10	13	22	30	5	4.0

Long Bone Preferences

- Metric: FORDISC
- Nonmetric: most prefer not to use (66.6%)

Source	First	Second	Third	Average Rank
Overall robusticity	53	21	10	1.5
Rogers (1999) distal humerus	22	33	8	1.8

Reporting

Do you use the results of these techniques and cite them in:

- Research publications? → 88.7%
- Archaeological site reports? → 71.3%
- Forensic case reports? → 66.9%

If you use multiple techniques that do not agree, you:

- Present sex estimation for each method → 42.0%
- Give preference to one skeletal region or method over others → 29.8%
- Decide based on personal experience or general impression → 12.2%
- Take the average of all methods → 12.2%
- Present each method, but present final assessment based on opinion → 3.8%

Discussion

- Methods employed and way results are reported varies considerably across the discipline
  - problematic, especially in forensic contexts
- Pelvis (pubic bone) is generally accepted as best indicator of sex due to differences between males and females related to childbirth
  - overwhelming preference of pelvis above all other regions by respondents reflects this long-held belief
- Selection of the skull as second most preferred area over the long bones is not surprising, as the skull has generally been presented in many introductory texts as the second best indicatory of sex
  - Spradley & Jantz (2011) demonstrated that long bones outperform skull in correct sex classification using metric methods
  - may be time to reconsider or reevaluate the utility of the skull for sex estimation above other skeletal regions

Conclusions

Understanding the preferences and methods being employed for sex estimation, as well as how results are reported, is the first step towards standardization. The main themes and findings from this research are consistent with those found for adult age estimation (Garvin and Passalacqua 2012). There is considerable variation present; however, the results of the various methods used are likely still accurate for sex estimation. The next step is recognizing the choices being made and our preferences to promote further discussions and then work towards standardization within our field.

Acknowledgements

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