



### F25 Estimating Sex for African-Americans Using Diagonal Molar Measurements

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After attending this presentation, attendees will: (1) learn that methods developed on White populations are not accurate for estimating sex for African American populations; (2) learn how to apply discriminant function equations for the estimation of sex from human remains; and, (3) learn how to test discriminant functions, developed on a White Greek population and apply them to an African American population.

This presentation will impact the forensic science community by: (1) showing that this is unique research and has not been published previously for an African American population; (2) providing data that will help in the positive identification of unknown human skeletal remains in African American populations; (3) providing data which shows that, for forensic cases, methods employed for estimation of sex must be developed using population-specific samples; and, (4) following the *Daubert* and *Mohan* rulings that require forensic methods to be scientifically tested and reproducible, this study has done this for diagonal measurements of teeth in African American populations.

In forensic cases where skeletal remains are fragmented or incomplete, the teeth may be used in place of more traditional bones for sex estimation. Using diagonal diameter molar measurements eliminates the need to measure between the interproximal spaces of the tooth, which can be difficult when the teeth are still located in the jaw.

The purpose of this study is to determine if the nine discriminant functions that were developed for a White Greek population will accurately estimate sex for an African American population. To do this, the current project assessed the degree of sexual dimorphism in permanent molars of African American skeletons using diagonal molar measurements of the crown and cervix, and then tested the effectiveness of each of the nine Greek discriminant functions for estimating sex using the African American skeletal sample.

In this research, 103 three individuals of African American ancestry were studied. Four diagonal diameter measurements were taken for each of the left mandibular and maxillary molars: mesiobuccal–distolingual crown diameter; mesiolingual–distobuccal crown diameter; mesiobuccal–distolingual cervical diameter; and, mesiolingual–distobuccal cervical diameter.

For all of the measurements, the percentage of sexual dimorphism yielded a positive percentage, indicating larger male dimensions for all molars. Statistical analyses revealed that the overall percentage of accuracy of the nine Greek discriminant functions for the entire African American sample (males and females combined) ranged between 47.9% and 55.9%. Function 5 (maxillary crown diameters) produced the highest percentage of accuracy (55.9%), while Function 2 (all maxillary molar diameters) produced the lowest percentage of accuracy (47.9%).

When estimating the sex of females only, the percentage of accuracy ranged between 0.0% and 16.3%. When estimating the sex for males only, the percentage of accuracy ranged between 95.5% and 100%. The mean measurement values for the African American females were larger than those for the Greek females, which may account for the increased likelihood of producing an estimation of male. The results suggest that the discriminant functions for the Greek population do not accurately estimate sex for an African American population.

#### Sex Determination, Diagonal Diameters, Molar Teeth