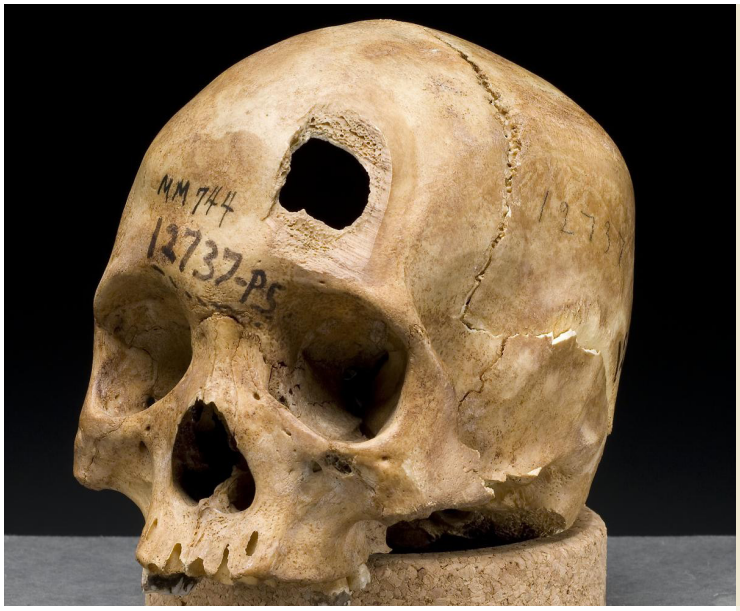
# NIJ and Texas State University—Improving Identification of Mexican Hispanic Remains

## New Information Helps Forensic Anthropologists Assess Mexican Hispanic Ancestry and Sex

Moving Knowledge from Research to Impact




*"Without the NIJ funding, none of this would have happened. We wouldn't be getting proper sex estimates for people who are considered Hispanic, or properly be able to identify their geographic origin with confidence. The funding was absolutely crucial."*

Kate Spradley, PhD
Biological Anthropologist
Texas State University–San Marcos

### Synopsis of Problem and Solution

In the United States, the Mexican Hispanic population ranks second in total size, yet Mexican Hispanic individuals often remain unidentified in forensic anthropological cases. The reason? There has been very little criteria developed to accurately assess the sex and ancestry of Mexican Hispanic individuals, which are two of the most crucial components of the biological profile.

Dr. Kate Spradley, a biological anthropologist at Texas State University–San Marcos, became aware of this issue while earning her PhD in anthropology at the University of Tennessee. While working a lab assignment to identify skeletal remains, she recognized that some of the bones were not those of American White or American Black individuals and that they were probably Mexican Hispanic, but there were too few criteria available for her to make that identification.

With research grants awarded by the National Institute of Justice (NIJ), Dr. Spradley developed the first ever accurate identification criteria for Mexican Hispanic individuals. She also developed a database of skeletal information on Mexican Hispanics along with classification functions for population-specific sex estimates applicable to the majority of Mexican Hispanics within the United States. The availability of this information has made it easier for forensic anthropologists to identify the remains of Mexican Hispanic individuals, and it has already been used in the identification of deceased, undocumented border crossers.

### Benefits

- Prior to this grant, there was not a population-specific technique for sex estimation for Mexican Hispanic individuals.
- Sex estimation for Mexican Hispanic individuals was previously estimated using American White identification criteria and yielded only around 50% accuracy for males; using the criteria developed during the project, the accuracy is now closer to 90%.
- Ancestry classification statistics for Mexican Hispanic individuals have risen from 70% accuracy to 85%+.

## The Future

- When the data are incorporated into FORDISC, it will be used by hundreds of anthropologists around the country for estimating ancestry from the cranium and postcranium.
- Data will continue to be collected, updated, and provided to the programmers and curators of tools used by forensic scientists.
- As sample sizes and datasets continue to grow, ancestral identifications will be able to be made within a specific region in Latin America.
- The data could also be useful in the future to help determine American-born vs. foreign-born Hispanics within the population.

## NIJ-Funded Research

Dr. Kate Spradley, biological anthropologist and associate pofessor at Texas State University–San Marcos, was awarded NIJ funding to obtain cranial and postcranial skeletal measurements of individuals from Mexico to establish a database of available reference data for further research and development; to create sectioning points and classification functions for population-specific sex estimates applicable to the majority of Mexican Hispanics within the United States; and to utilize traditional and geometric morphometric methods with the new reference data to explore morphological variation among Mexican Hispanics, American Blacks, and American Whites, to provide better classification accuracy in ancestry estimation.

## Bringing Research to Practice

- A paper by Tise, Spradley, and Anderson published in the *Journal of Forensic Sciences* in January 2013 was the first publication on the topic of identifying Mexican Hispanic individuals from skeletal remains.
- The data collected have been made available through the Forensic Anthropology Data Bank (FDB) curated at the University of Tennessee at Knoxville.
- The data have also been submitted to FORDISC, a tool widely used by forensic anthropologists to assist in the creation of a decedent's biological profile, and will be assimilated in 2015.
- Landmark data from positively identified individuals have been provided to the programmers of 3D-ID, a tool used by forensic scientists to determine sex and ancestral affiliation.
- The developed criteria and skeletal data are currently being used by the Pima County Office of the Medical Examiner in Arizona.

Dr. Kate Spradley, with support funding from NIJ, developed criteria that can be used to identify a Mexican Hispanic individual's remains.

## Publications

Spradley, M. K., Anderson, B. E., Tise, M. L. (2015). Postcranial sex estimation for Mexican Hispanics. *Journal of Forensic Sciences, 60*(S1), S27-S31.

Spradley, M. K. (2014). Ancestry estimation from the postcranial skeleton. In G. Berg and S. Ta'ala (Eds.), *Biological affinity in forensic identification of human skeletal remains: Beyond black and white.* CRC Press.

Spradley, M. K. (2014). Towards estimating geographic origin of migrant remains along the United States Mexico border. *Annals of Practicing Anthropology, 38*(1), 101-110.

Tise, M. L., Kimmerle, E. H., & Spradley, M. K. (2014). Craniometric variation of diverse populations in Florida: Identification challenges within a border state. *Annals of Practicing Anthropology, 38*(1), 111-112.

Hefner, J. T., Spradley, M. K., & Anderson, B. E. (2014). Ancestry assessment using random forest modeling. *Journal of Forensic Sciences, 59*(3), 583-589.

Tise, M. L., Spradley, M. K., & Anderson, B. E. (2012). Postcranial sex estimation of individuals considered Hispanic. *Journal of Forensic Sciences, 58*(1), s9-s14.

Spradley, M. K., Jantz, R. L., Robinson, A., & Peccerelli, F. (2008). Demographic change and forensic identification: Problems in metric identification of Hispanic skeletons. *Journal of Forensic Sciences, 53*(1), 21-28.

## More Information

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