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INTRODUCTION

- Stress during childhood can leave permanent markers on the teeth known as **linear enamel hypoplasias** or **LEH**.
- Quantity and severity of linear enamel hypoplasias in populations can be used to indicate differences in stress severity during childhood development.
- This study utilizes the Smithsonian's Terry Collection to compare enamel hypoplasia severity and frequency between African American and Caucasian males born during **Reconstruction** (1865-1877) and **Early Jim Crow** (1877-1900) to ascertain social and historical impacts on biological health of different ethnicities.

BACKGROUND

Terry Anatomical Collection

- Research collection of human skeletal remains obtained from cadavers used in medical school anatomy classes in the early 20th century. These remains were primarily obtained from unclaimed individuals at St. Louis, Missouri hospitals and insitutional morgues and represent individuals of low socioeconomic class. Remains have known age, sex, race, and cause of death (Hunt et. al., 2005).

Historical Context

- Reconstruction Era (1865-1877)**
Post-Civil War and end of the Confederacy as well as the continued rise of industrialization in the North while the South attempted to recover from war. Job opportunities became available in northern cities (Cova, 2010).
- Early Jim Crow Era (1877-1900)**
Segregation and oppression reduced African American quality of life and encouraged migration to northern cities like St. Louis (Cova, 2010).

Linear Enamel Hypoplasias (LEH)

- Developmental disturbances reduce enamel production by ameloblasts that leave measurable defects on the enamel of adult canines and incisors (White and Folken, 2005; Goodman and Rose, 1990).
- Studies of living populations show that high LEH occurrence can indicate malnutrition during childhood (Sweeney et al., 1969).

HYPOTHESIS AND PREDICTIONS

- Hypothesis**
 - The historical and social contexts of the Reconstruction and Early Jim Crow eras would have had differential impacts on childhood stress for male African Americans than male Caucasians.
- Predictions**
 - Total sample would have experienced stress due to low socioeconomic class.
 - The severity of EHP would be relatively similar for African Americans and Caucasians during Reconstruction.
 - The severity of EHP would be greater for African Americans during the Jim Crow era relative to caucasians.
 - These differences in EHP result from historical events that would more severely cause stress for African Americans than Caucasians during Early Jim Crow compared to Reconstruction.

MATERIALS AND METHODS

- Sample of N=102 (Table 1) included male individuals with a least one canine or incisor. Teeth less than 25% intact were excluded from the sample.
- LEH band width measured in millimeters using a needle-nose Mitutoyo sliding digital caliper with 10x illuminated magnifier.
- LEH band position on tooth measured from the cemento-enamel junction (CEJ) to bottom of defect (Image 1).
- For my analyses, I applied the Chi Square Test of Independence and Mann-Whitney using IBM SPSS Statistics.

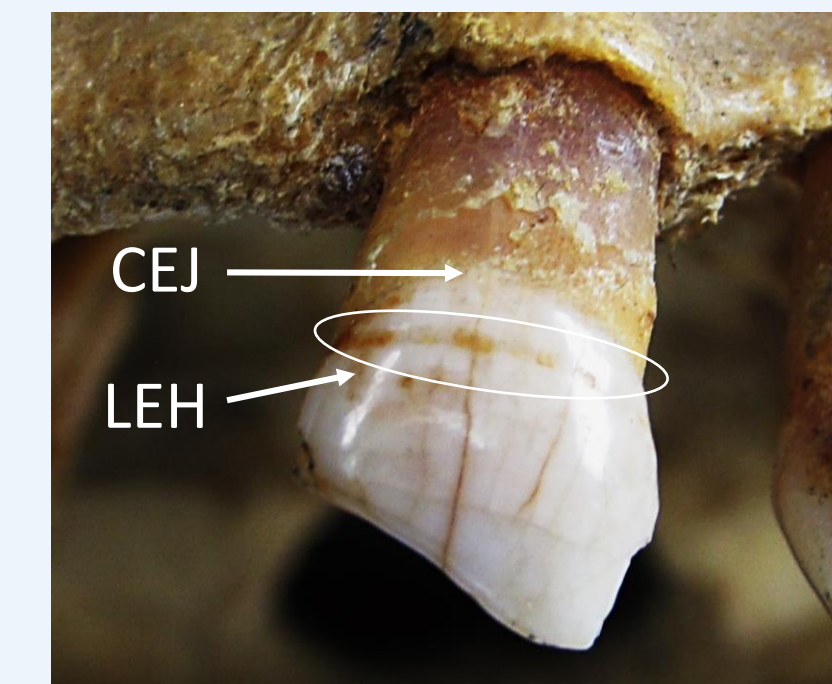


Image 1: CEJ and LEH example

N = 102	African Americans	Caucasians	Total
Reconstruction	26	26	49
Early Jim Crow	29	24	53
Total	55	47	102

Table 1: Sample breakdown



Image 2: Caucasian (left) and African American (right) individuals from Smithsonian Terry Anatomical Collection

RESULTS

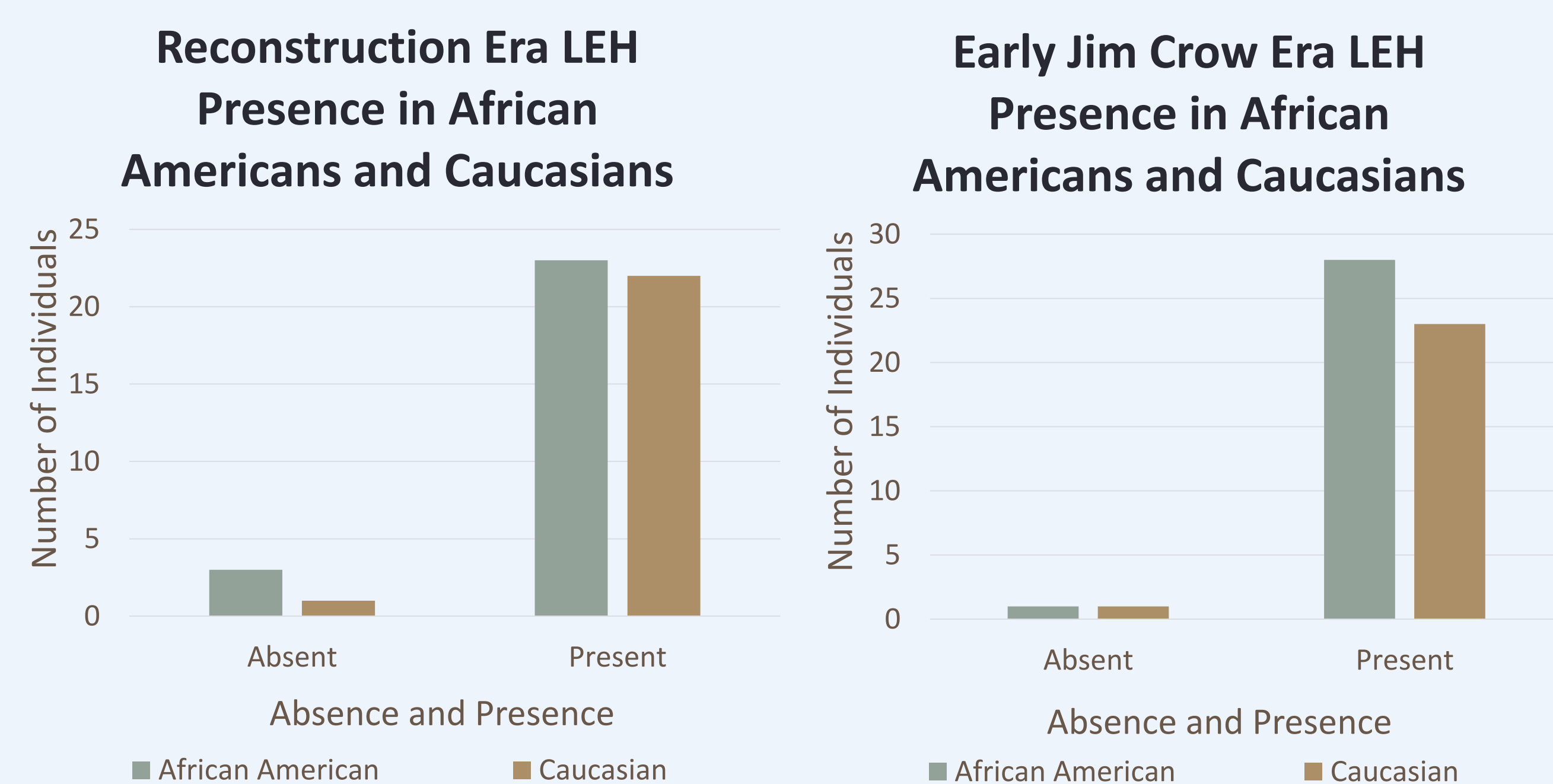


Figure 1: Presence of LEH in African Americans During Reconstruction and Early Jim Crow eras

RESULTS

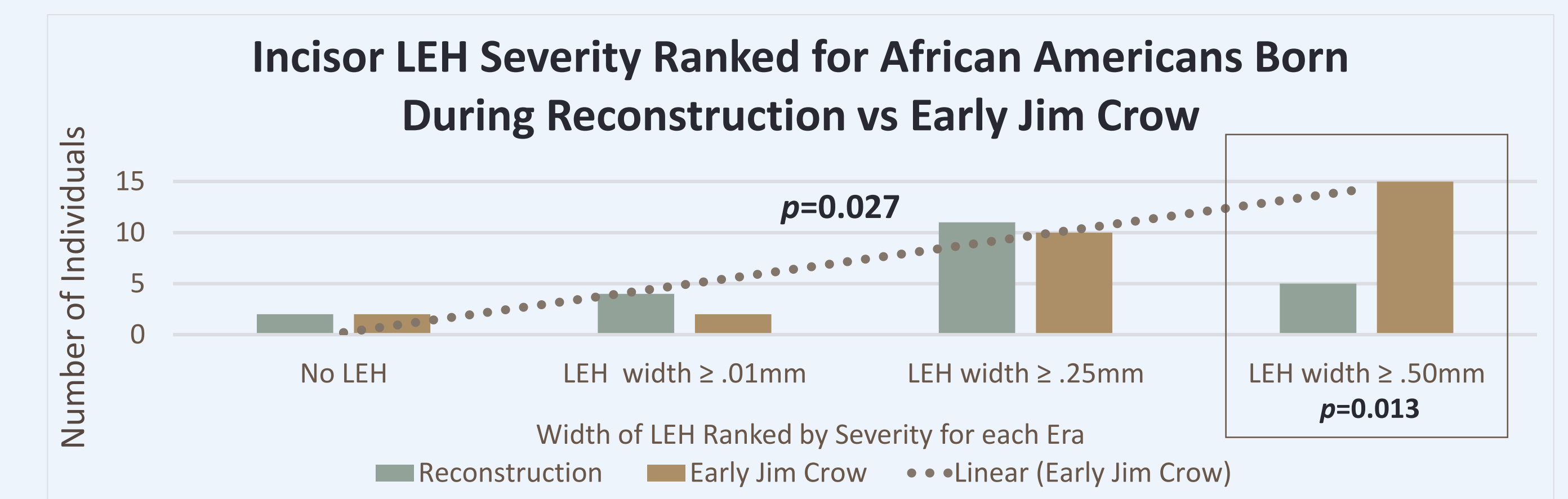


Figure 2: Incisor LEH Severity for African Americans in each Era

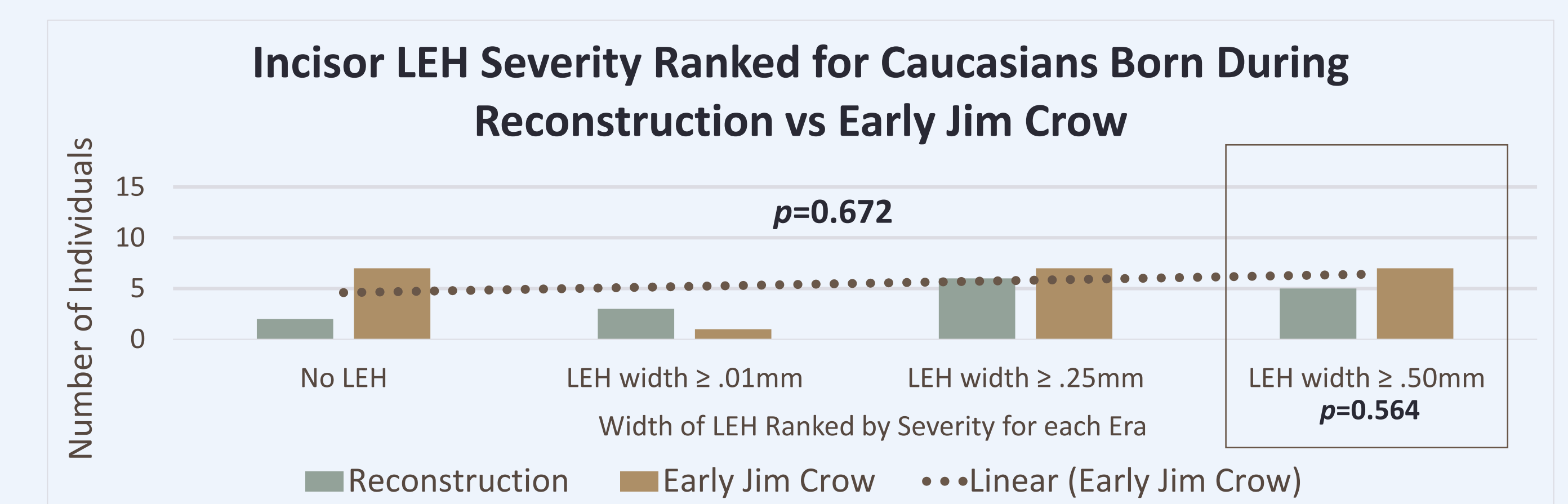


Figure 3: Incisor LEH Severity for Caucasians in each Era

CONCLUSIONS

Predictions supported (Figures 1-3):

- LEH was present in almost all individuals at a 95% occurrence.
- There was a significant difference ($p=0.012$) between the occurrence of severe ($\geq 50\text{mm}$) LEH on the incisors of African Americans born during Reconstruction and the Early Jim Crow era but not for Caucasians ($p=.0564$).
- There was also a overall a significant difference ($p=0.027$) in the occurrence of LEH for African Americans during Early Jim Crow compared to Reconstruction, but not for Caucasians ($p=0.672$).
- There was a difference ($p=.052$) in the occurrence of ranked severity of LEH between African Americans and Caucasians during the Early Jim Crow era.

Conclusions

- Despite both ethnicities and all time frames having a high occurrence of LEH (Figure 1), there was a significant increase in LEH $\geq 50\text{mm}$ in African Americans born during Jim Crow compared to African Americans born during Reconstruction. Additionally, there was not a significant difference in LEH $\geq 50\text{mm}$ in Caucasians born during Early Jim Crow compared to Caucasians born during Reconstruction. There was also a near significant difference in overall ranked severity of LEH between African Americans and Caucasians for the Early Jim Crow era.
- High LEH occurrence may be indicative of higher stress associated with low socioeconomic class. The higher occurrence of greater width LEH for African Americans during the Early Jim Crow era may be indicative of more severe or prolonged stress periods. This shows the biological impacts of ethnic discrimination and how historical events can leave physical markers on the remains of individuals.