

Figure 6.1 Loss of mass of teeth due to sectioning, expressed as percent reduction from original mass.

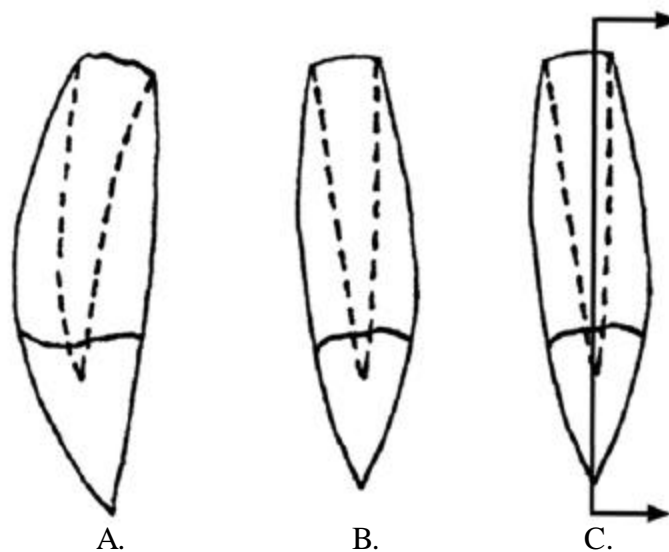


Figure 6.2 Upper right canine of male northern fur seal. Labial view (A.), anterior view (B.), and path of saw for sectioning (C.). Dashed line indicates pulp cavity.

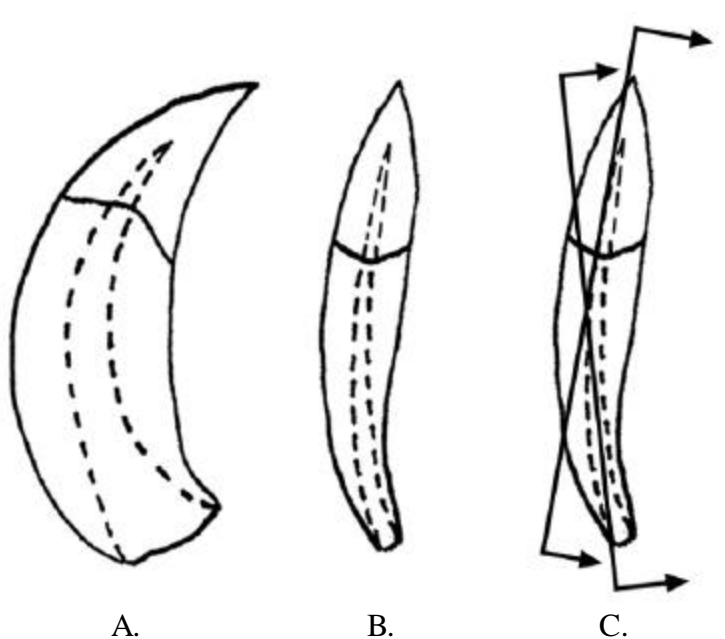


Figure 6.3 Lower right canine of male northern fur seal. Labels as in Figure 6.2.



Figure 6.4 Etched section of MCRC 40220, showing distinct ridges in each of the four growth layer groups (GLGs). Arrows indicate ridges interpreted as annular growth arrest lines. This individual was assigned to the 4.5 year age category.

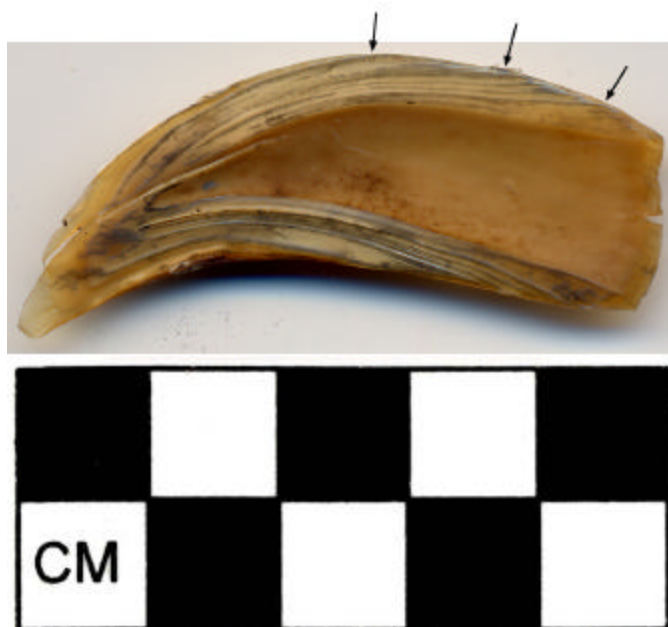


Figure 6.5 Etched section of MCRC 54832, showing complex pattern of (GLGs). Arrows indicate ridges interpreted as annular growth arrest lines. This individual was assigned to the 3.5 year age category.

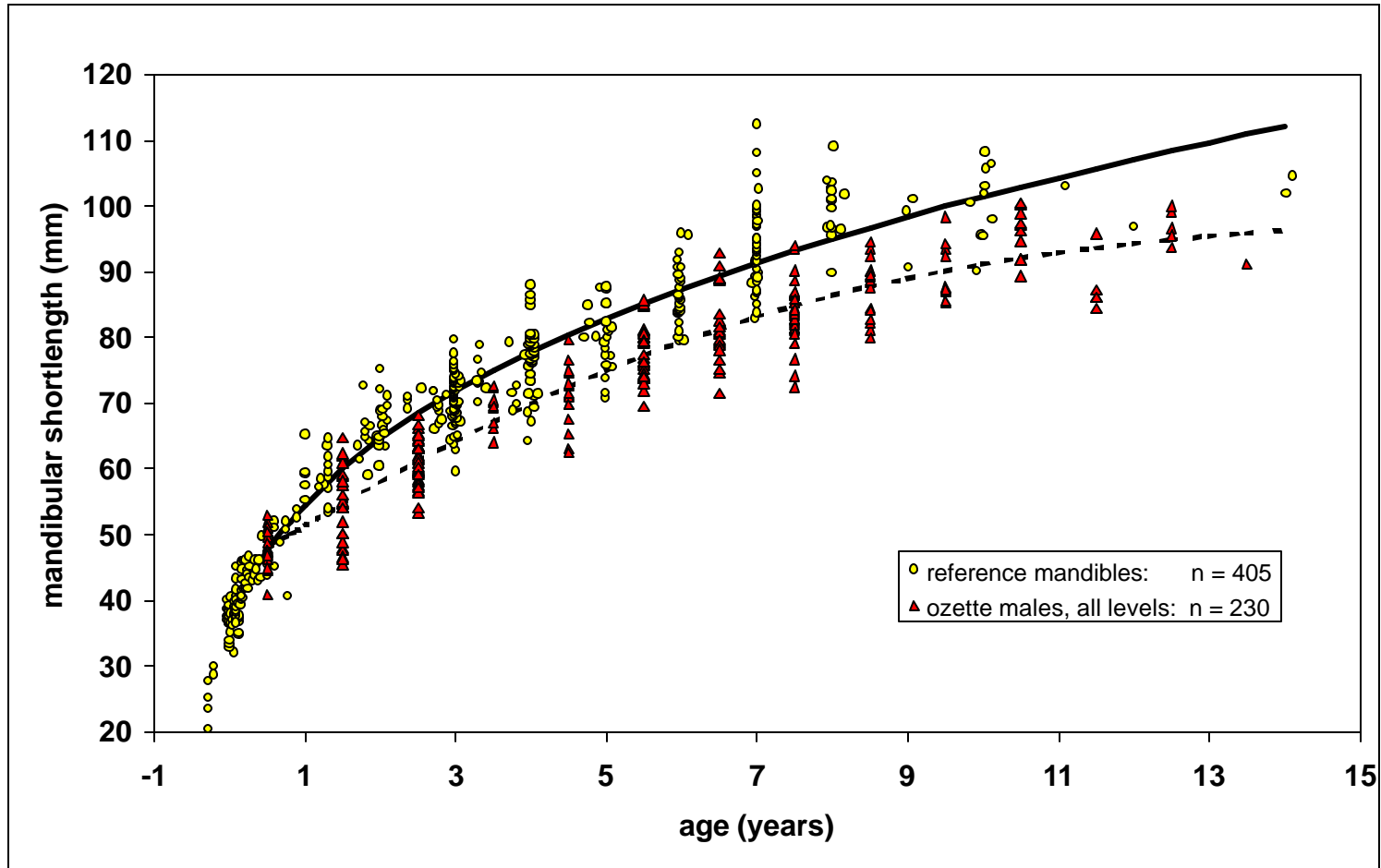


Figure 6.6 Comparison of mandible growth curves for male fur seals based on reference mandibles (solid line) and mandibles from Ozette (dashed line). See Table 6.2 for parameter estimates and summary statistics.

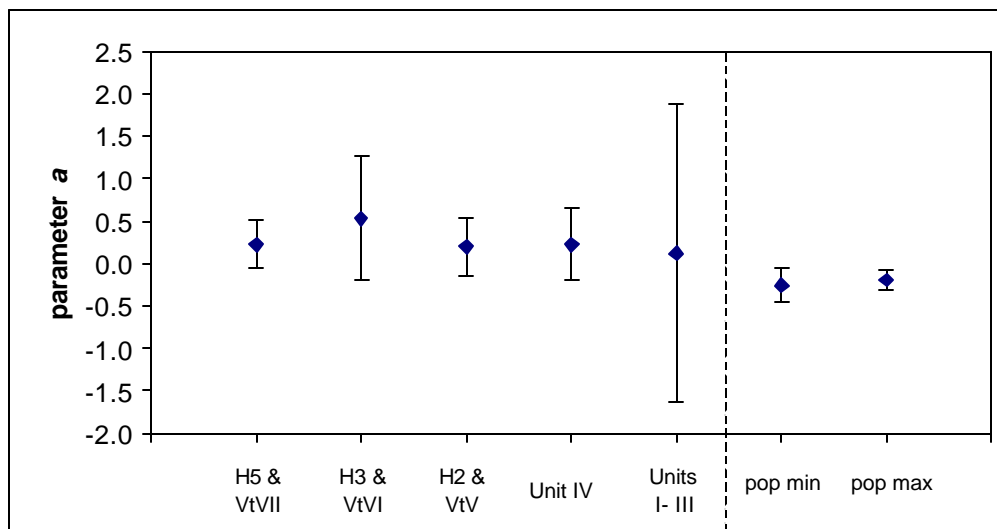


Figure 6.7 Temporal trends in VB growth curve parameter a with 95% confidence interval for parameter estimate. The two entries at the far right represent the values for the reference sample at the population minimum and maximum, respectively. See Table 6.1 for stratigraphic information.

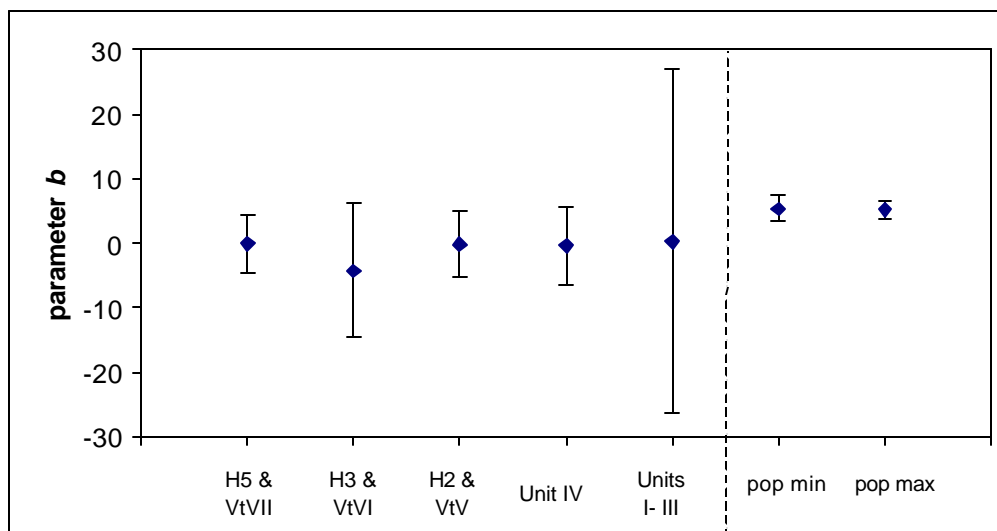


Figure 6.8 Temporal trends in VB growth curve parameter b with 95% confidence interval for parameter estimate. The two entries at the far right represent the values for the reference sample at the population minimum and maximum, respectively. See Table 6.1 for stratigraphic information.

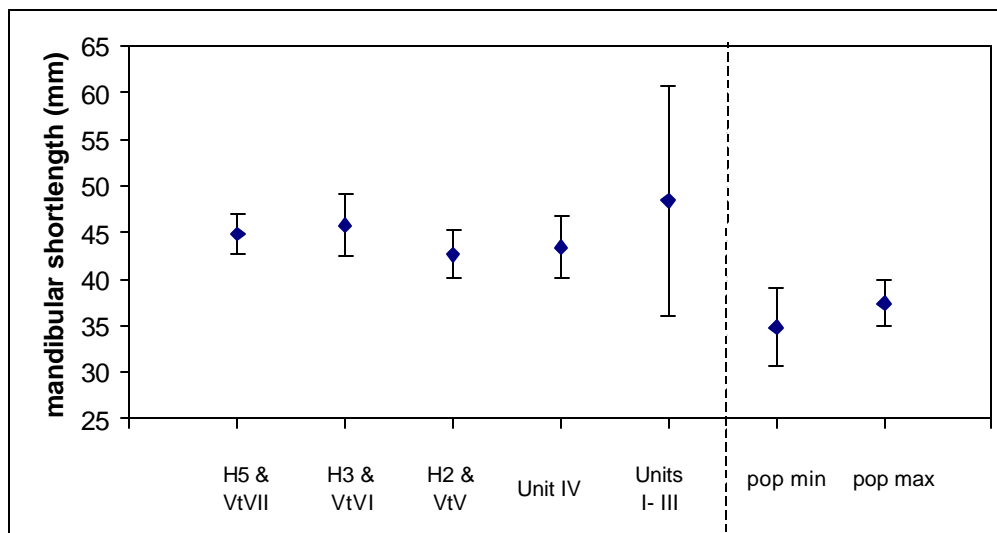


Figure 6.9 Temporal trends in VB growth curve parameter y_1 (mandible size at age zero), with 95% confidence interval for parameter estimate. The two entries at the far right represent the values for the reference sample at the population minimum and maximum, respectively. See Table 6.1 for stratigraphic information.

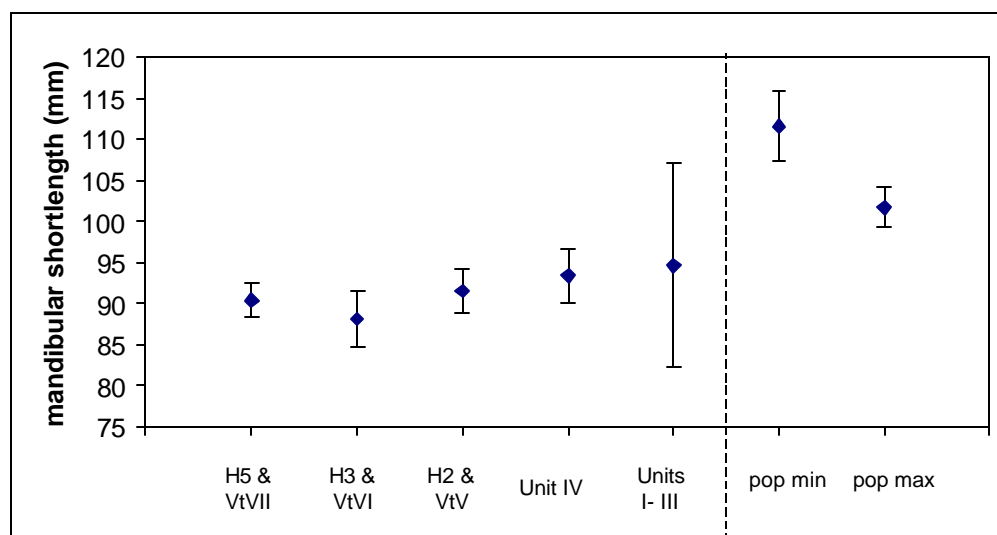


Figure 6.10 Temporal trends in VB growth curve parameter y_2 (mandible size at age eight), with 95% confidence interval for parameter estimate. The two entries at the far right represent the values for the reference sample at the population minimum and maximum, respectively. See Table 6.1 for stratigraphic information.

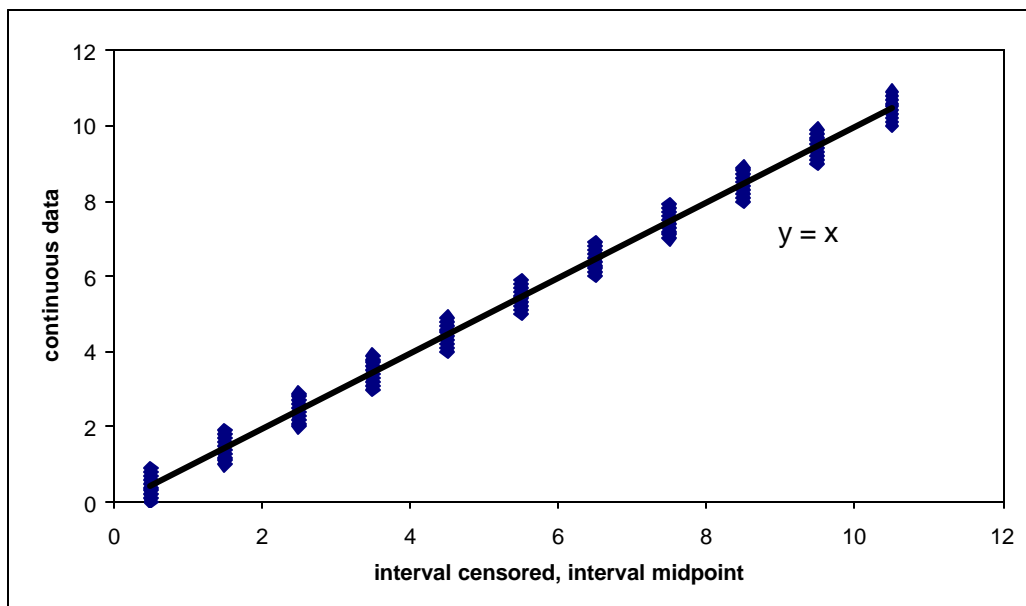


Figure 6.11 Hypothetical age estimates plotted as interval-censored data on the x-axis and continuous data on the y-axis. The slope that describes this relationship will be $y = x$ if both estimates of age are accurate.

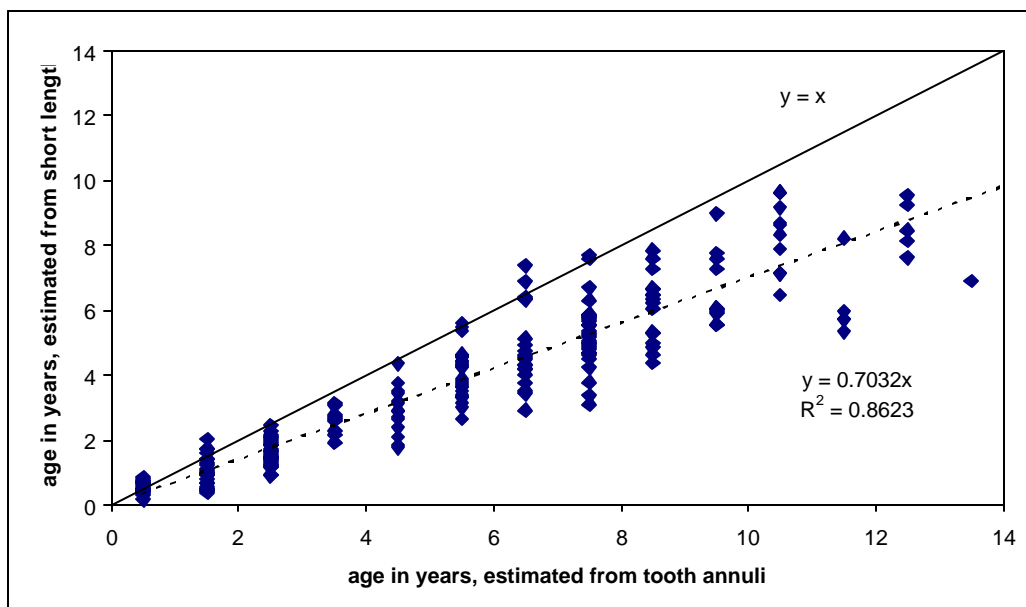


Figure 6.12 Comparison of independent age estimates for male mandibles from Ozette. Age estimates plotted as interval-censored tooth section data on the x-axis and continuous data (based on calibration of age based on mandible length) on the y-axis. Solid line represents the line $y = x$ and the dashed line represents the regression line estimated for the Ozette data.

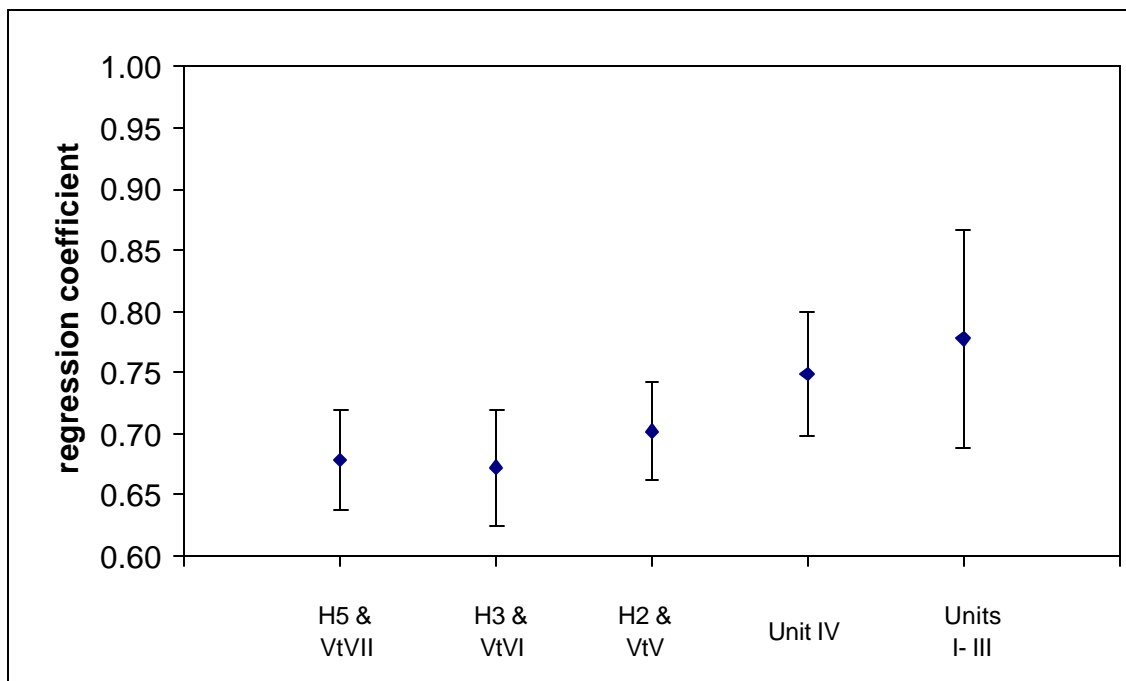


Figure 6.13 Temporal trends in regression coefficient (with 95% confidence intervals around the estimate of the coefficient) describing the relationship between age estimation based on tooth sections and age estimation based on calibration of mandible length. If the two were both estimating age accurately the regression coefficient would be 1.0. See Table 6.1 for stratigraphic information.

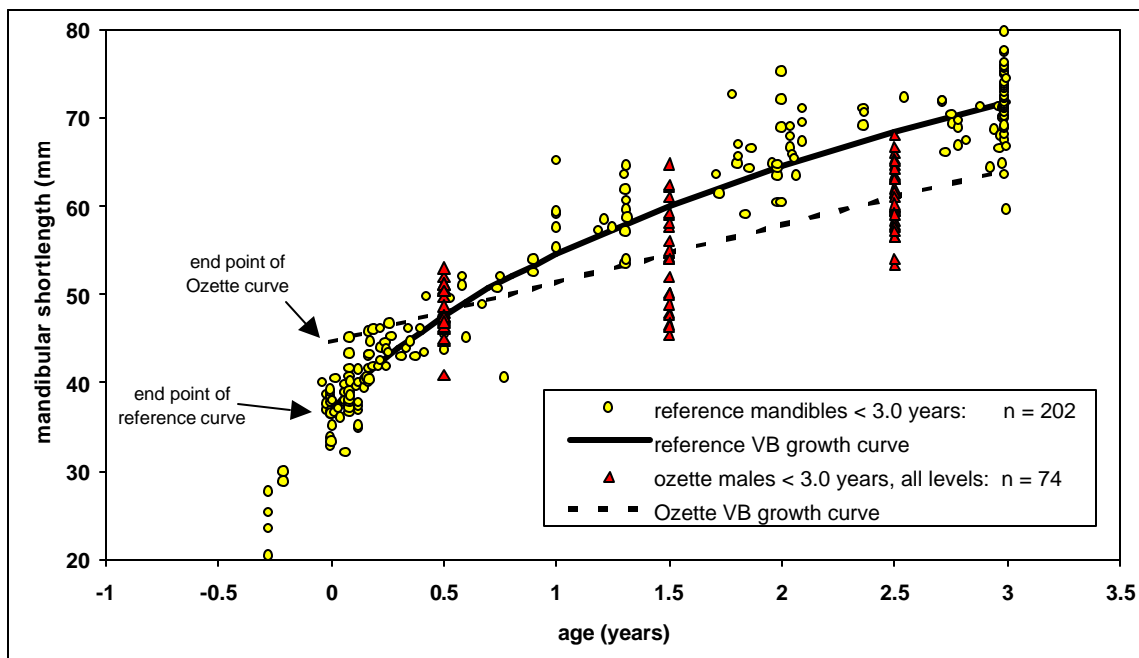


Figure 6.14 Comparison of growth curves for reference mandibles (solid line) and mandibles from Ozette (dashed line), focusing on the first three years of growth. See Table 6.2 for parameter estimates and summary statistics.

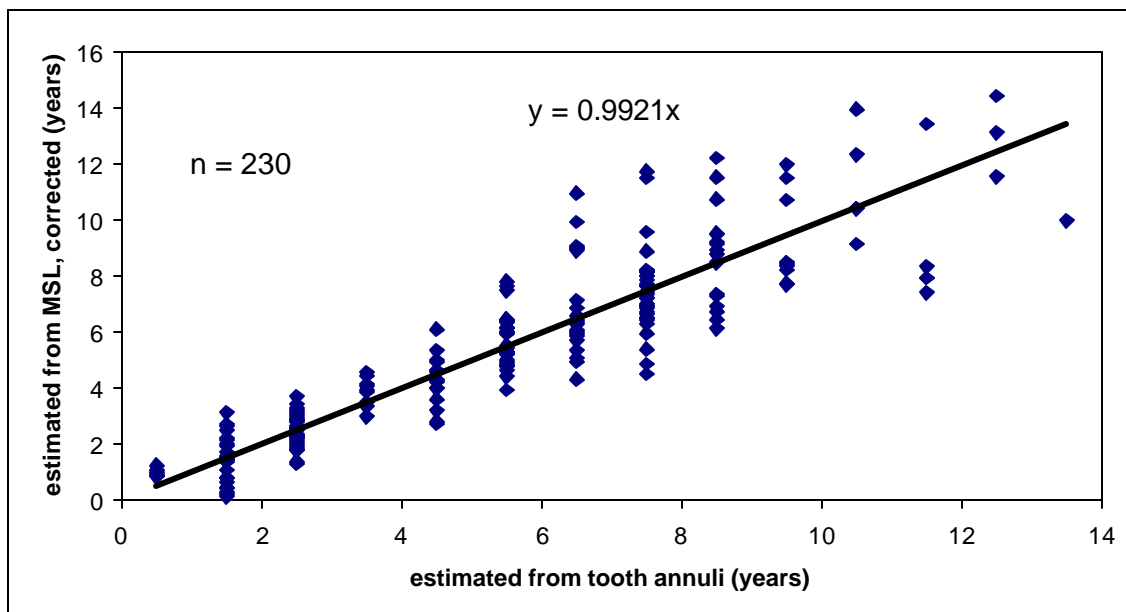


Figure 6.15 Relationship between age estimates based on MSL using the Ozette VB growth curve and age estimates based on tooth annuli, for male mandibles = 50.00 mm. Regression line has been forced through the origin. See Table 6.4 for summary statistics.

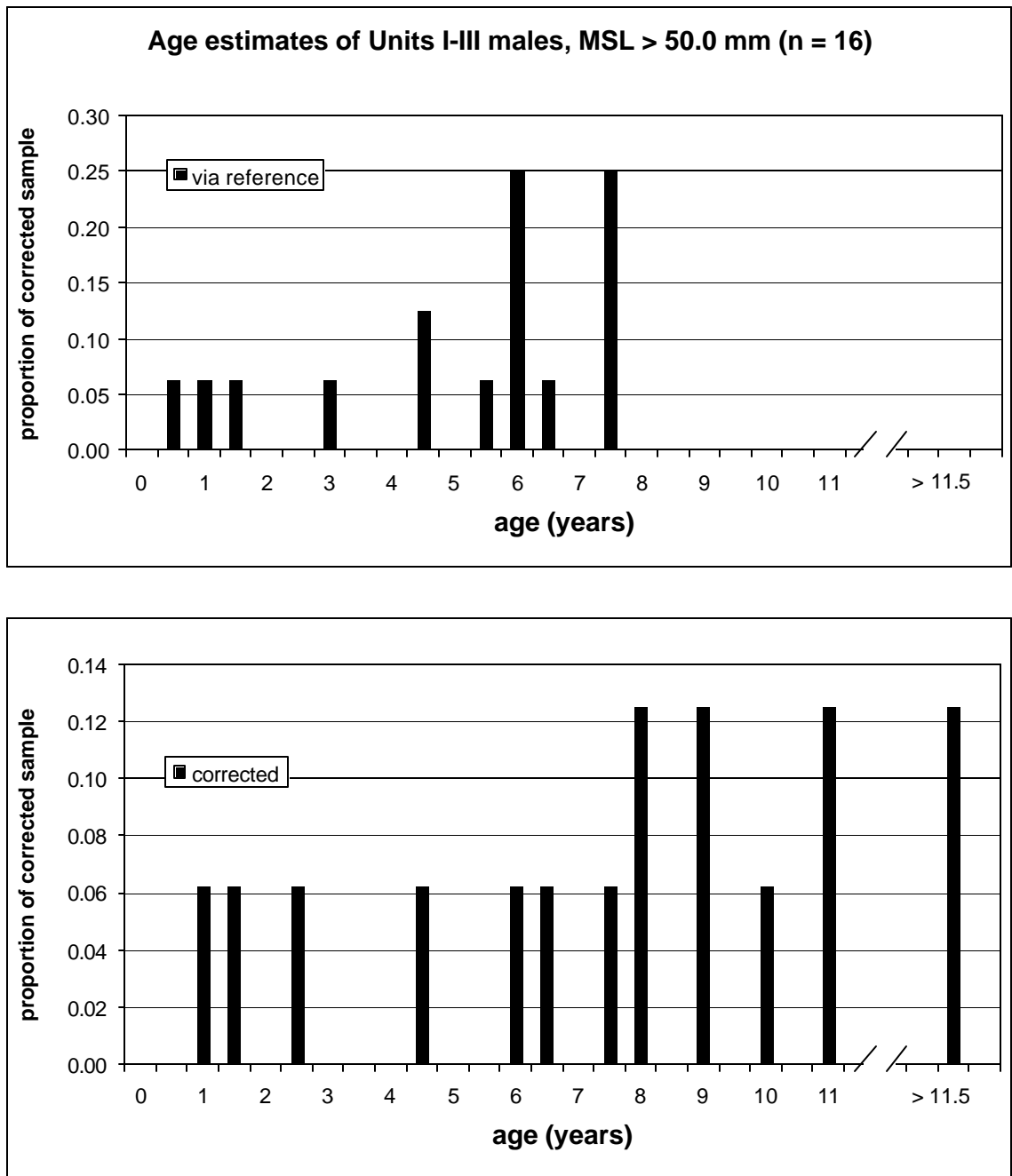


Figure 6.16 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, Units I-III, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

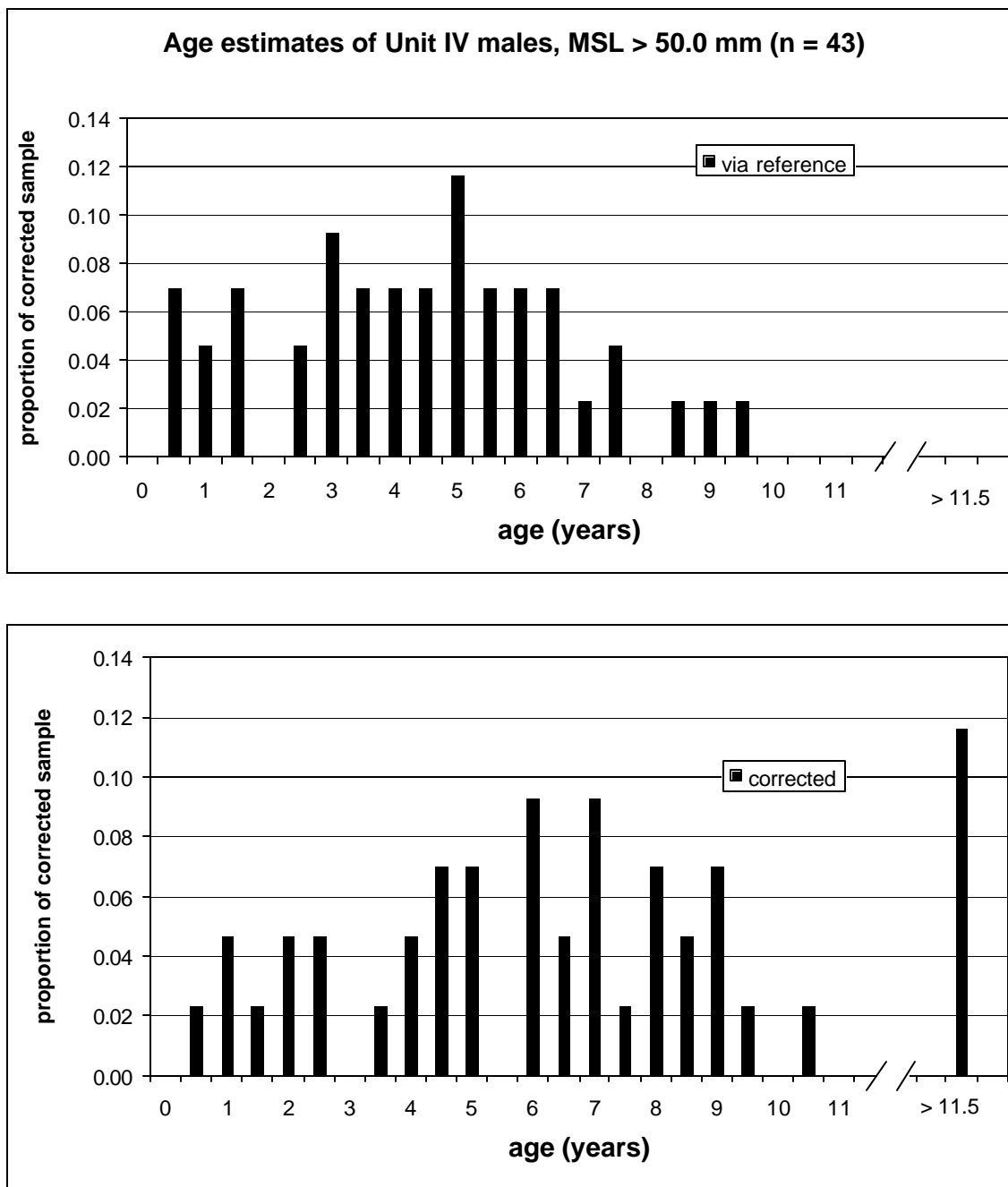


Figure 6.17 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, Unit IV, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

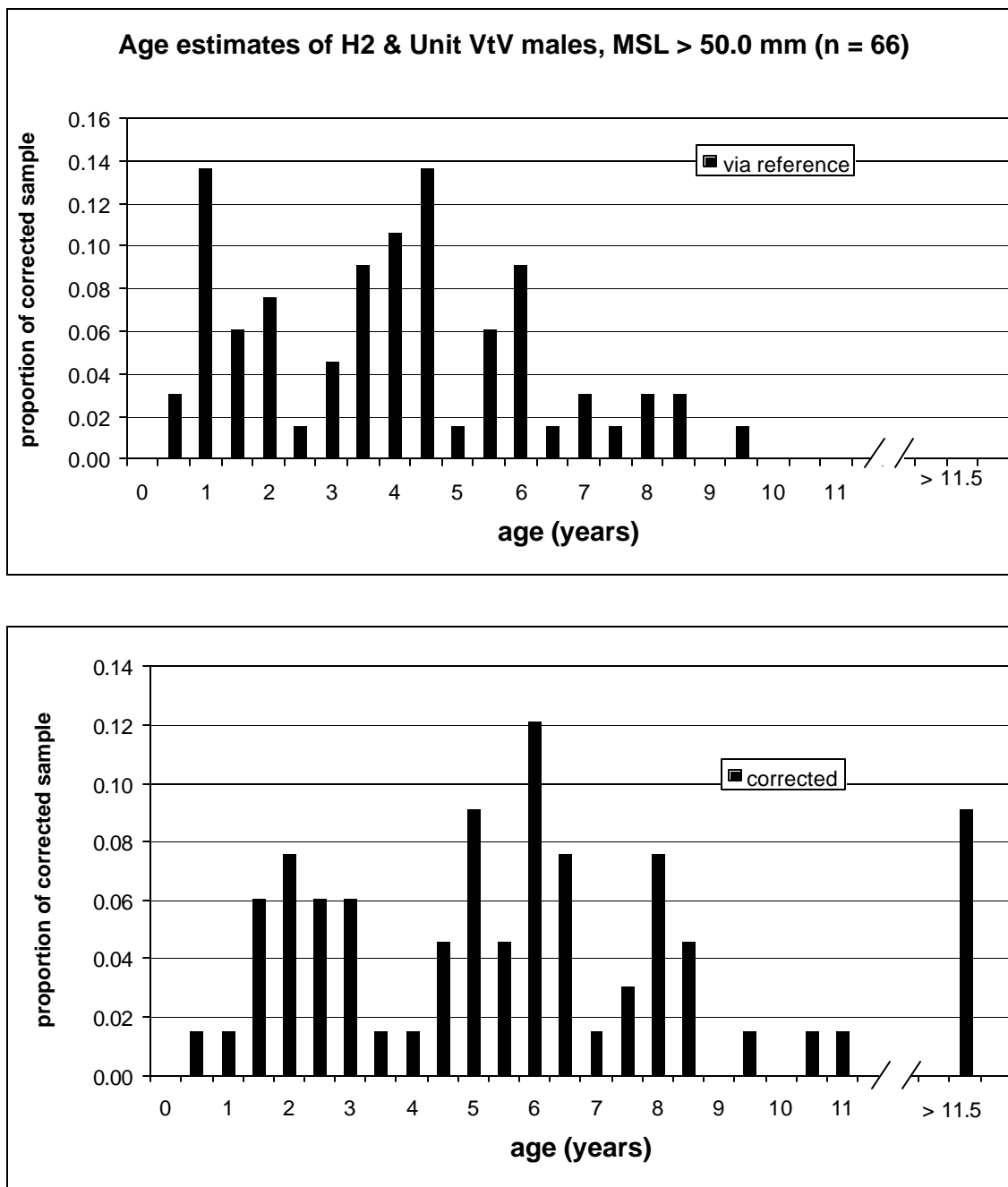


Figure 6.18 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, House 2 and Unit VtV, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

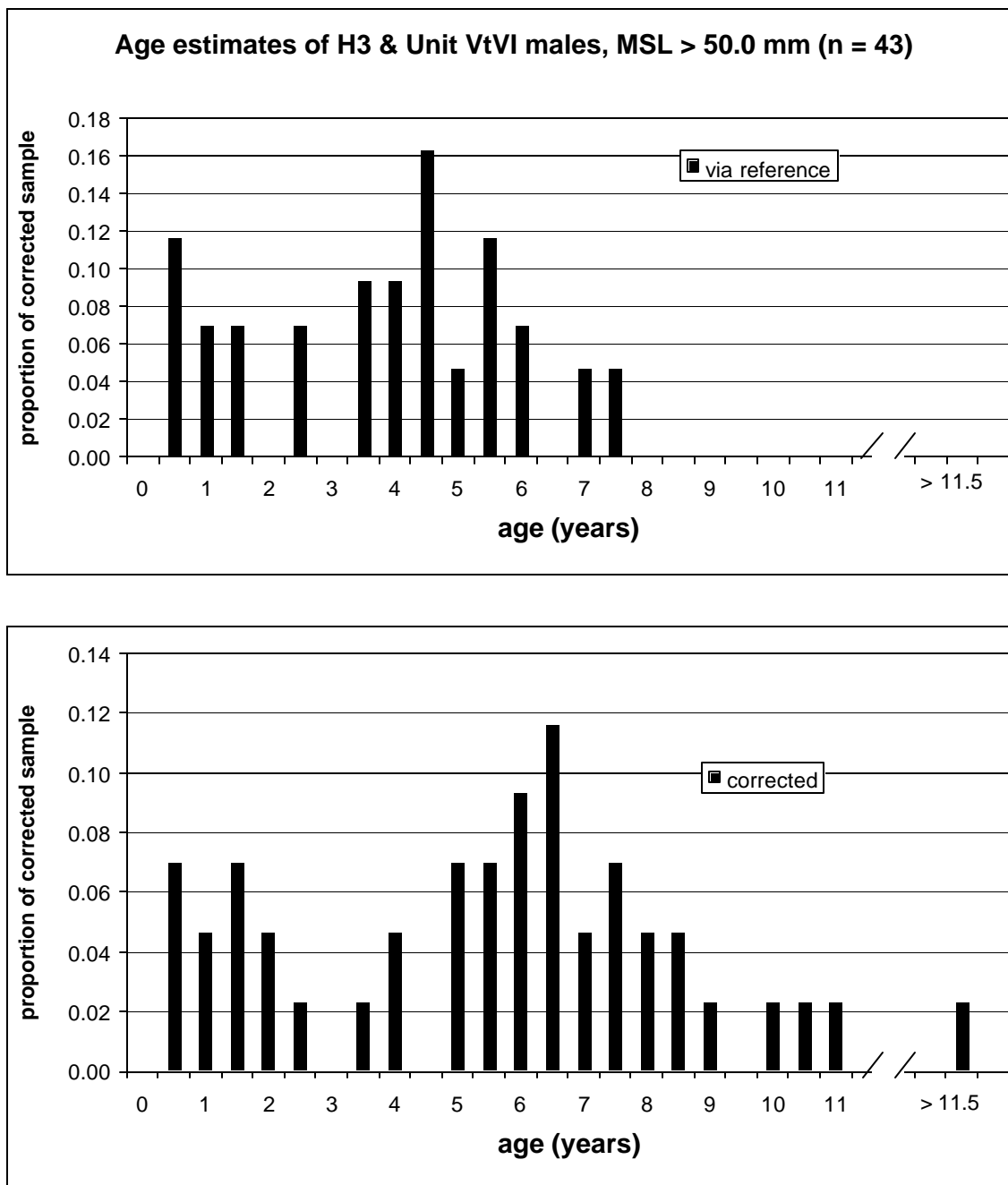


Figure 6.19 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, House 3 and Unit VtVI, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

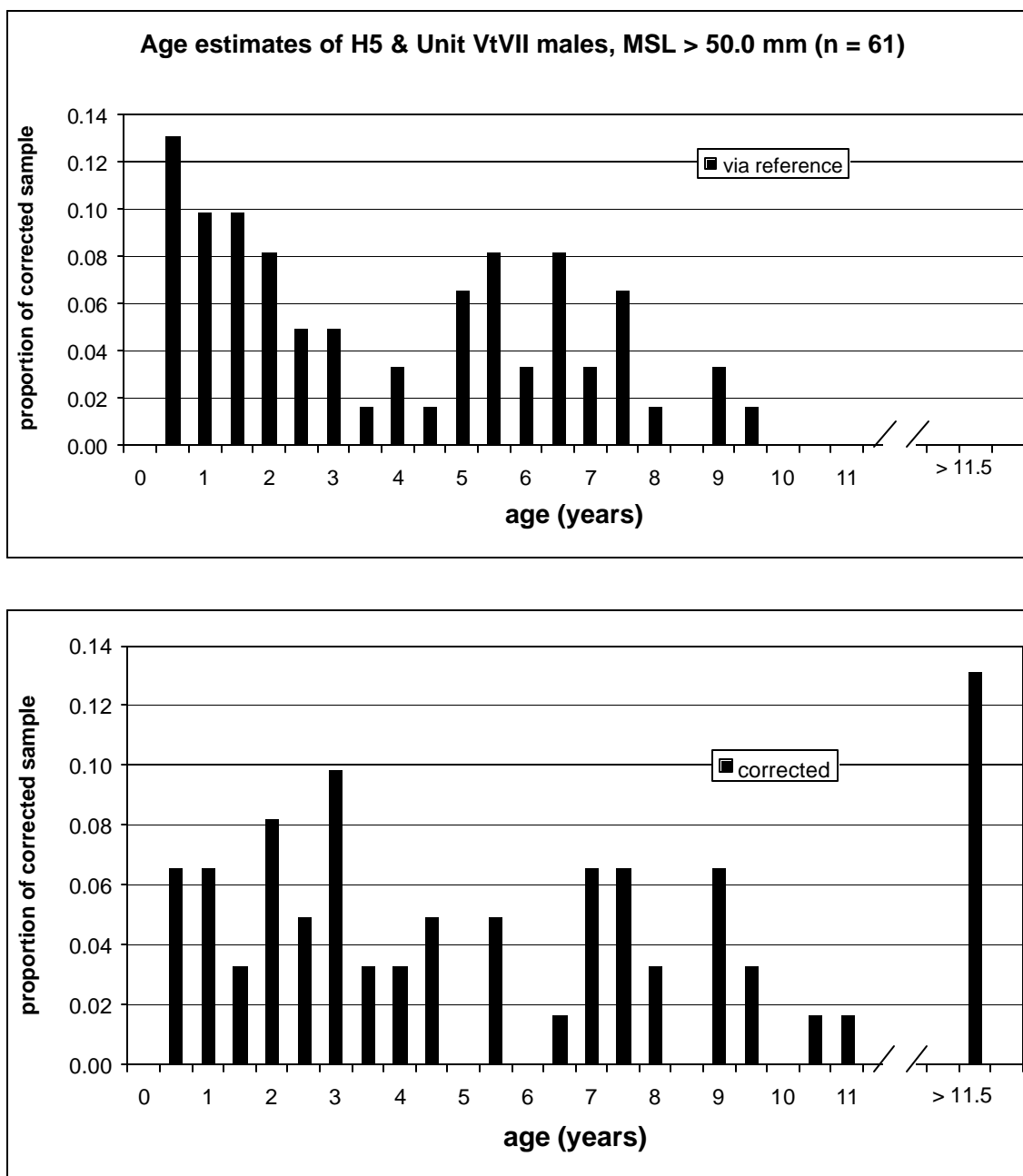


Figure 6.20 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, House 5 and Unit VtVII, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

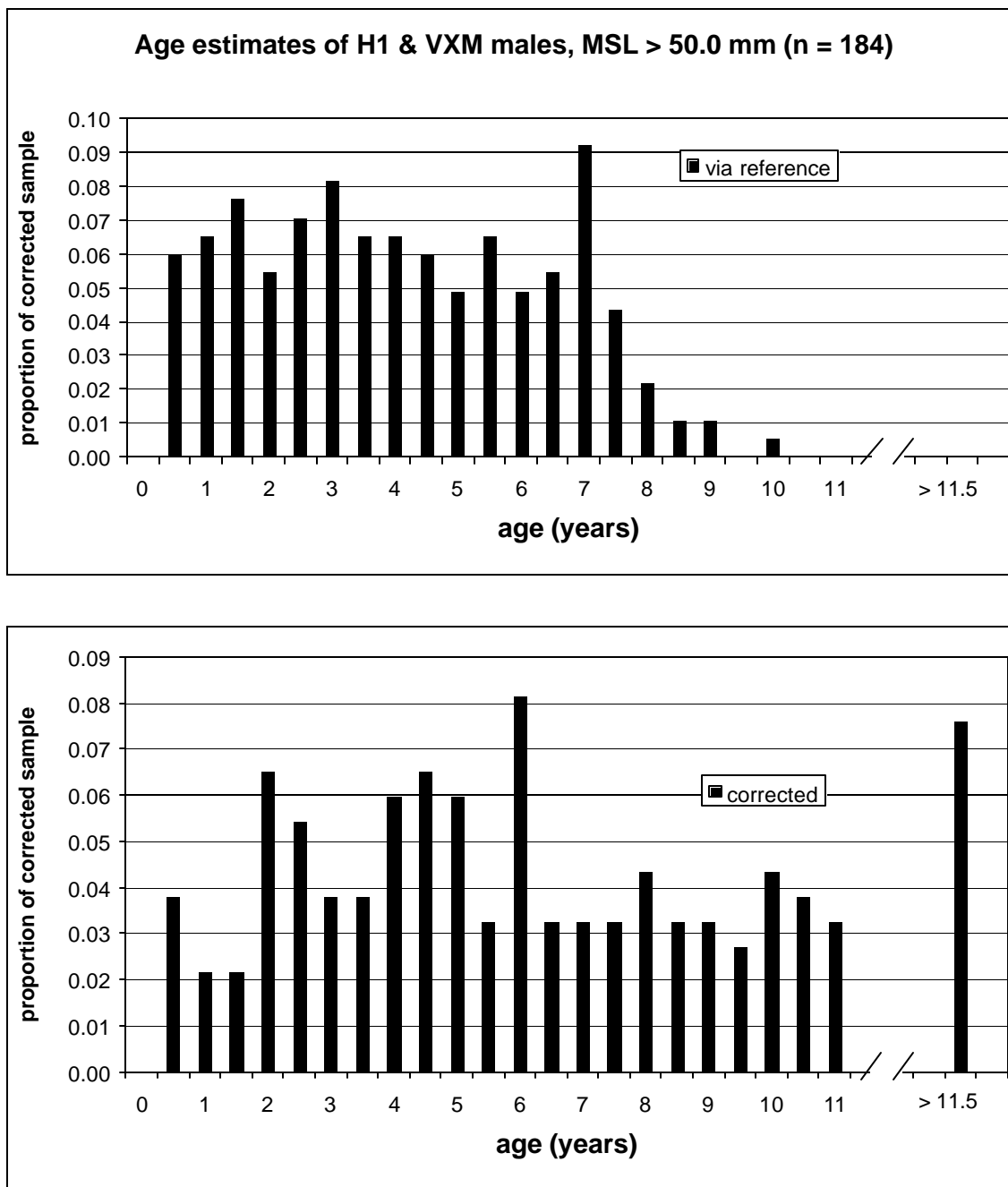


Figure 6.21 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, House 1 and VXM, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

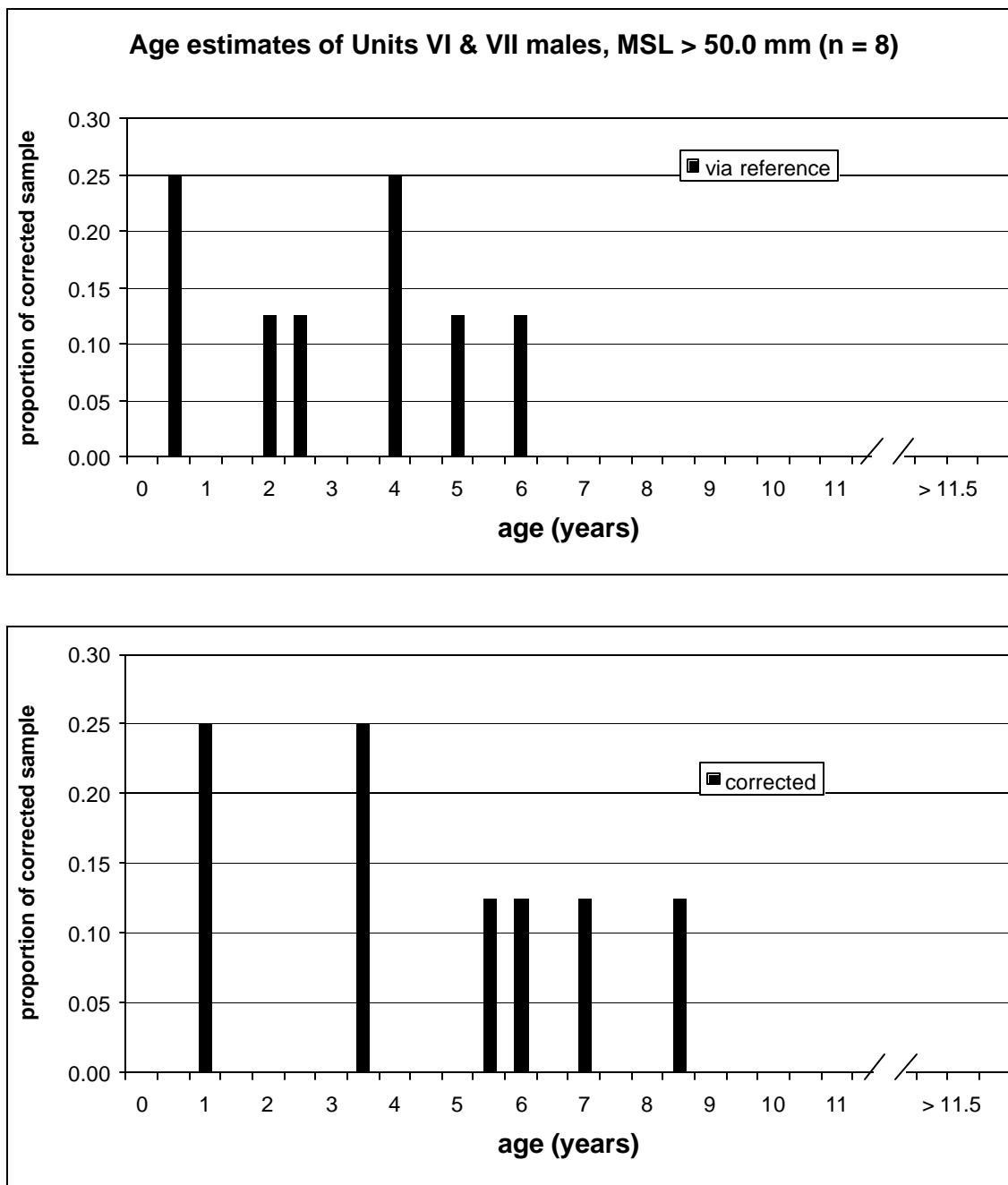


Figure 6.22 Comparison of estimated age distribution for male mandibles = 50.00 mm from Ozette, Units VI and VII, based on full reference VB growth curve (top) and Ozette VB growth curve (bottom). See Table 6.1 for stratigraphic details.

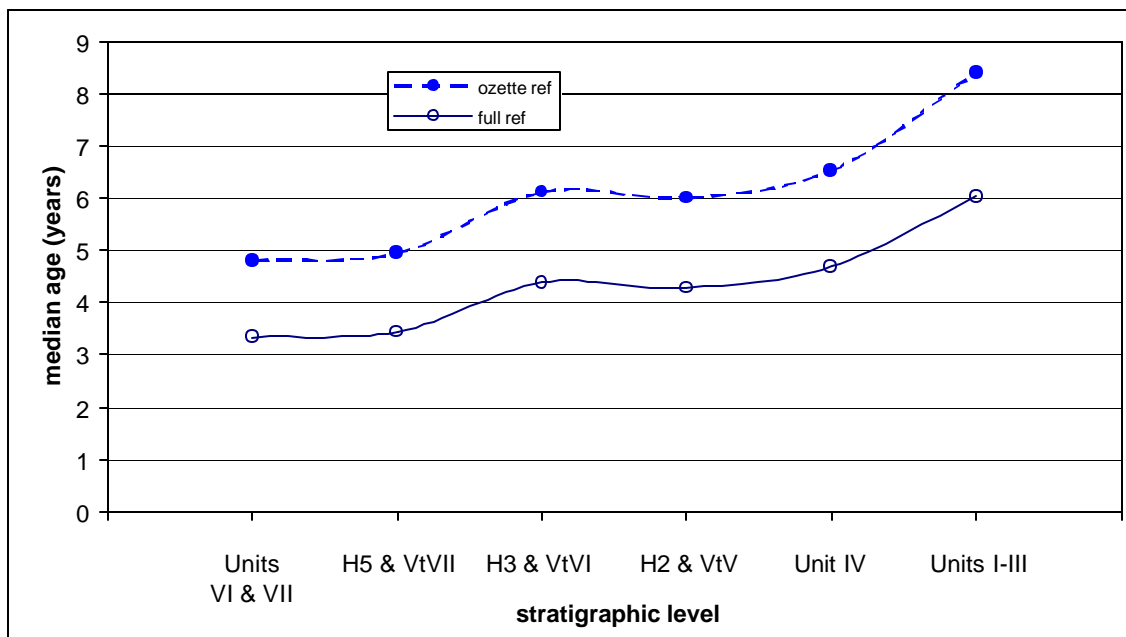


Figure 6.23 Comparison of trends in median ages of male mandibles = 50.00 mm from Ozette, based on full reference VB growth curve (solid line) and Ozette VB growth curve (dashed line). See Table 6.1 for stratigraphic details..

Table 6.1 Number of identified fur seal specimens and dates for the major stratigraphic units of Ozette, and the number of specimens included in the growth rate analysis. Bold numbers represent stratum totals.

| Cultural Unit | Excavation Unit | Date | female | unknown | male | total fur seals | tooth sections (males only) |
|---------------|------------------|---------------------------|------------|------------|------------|-----------------|-----------------------------|
| I | I | late 1800s to early 1900s | 5 | 2 | 3 | 10 | 2 |
| III | III | ~AD 1780 | 22 | 2 | 16 | 40 | 8 |
| IV | IV | < AD 1719 | 66 | 12 | 66 | 144 | 28 |
| V | House 2 | ?? | 54 | 17 | 64 | 135 | 37 |
| | V temp V | to | 27 | 6 | 39 | 72 | 21 |
| | sub-total | < AD 1719 | 81 | 23 | 103 | 207 | 58 |
| V | House 3 | | 64 | 13 | 49 | 126 | 21 |
| | V temp VI | | 22 | 11 | 25 | 58 | 13 |
| | sub-total | | 86 | 24 | 74 | 184 | 34 |
| V | House 5 | AD 1440 | 27 | 12 | 25 | 64 | 12 |
| | V temp VII | to | 52 | 9 | 62 | 123 | 38 |
| | sub-total | ?? | 79 | 21 | 87 | 187 | 50 |
| V | House 1 | | 48 | 13 | 42 | 103 | 22 |
| | all other Unit V | AD 1440 | 224 | 50 | 233 | 507 | 28 |
| | sub-total | | 272 | 63 | 275 | 610 | 50 |
| VI | VI | | 2 | 7 | 7 | 16 | n.a. |
| VII | VII | AD 1220 | 3 | 5 | 0 | 8 | n.a. |
| TOTAL | | | 616 | 161 | 631 | 1406 | 230 |

Table 6.2 Von Bertalanffy parameter estimates for archaeological and reference samples. Tabled values include correlation coefficient (r^2), sample size, standard error of the estimate (SE), and 95% confidence intervals of the estimate. Starting values of 0.0 and 8.0 were used for T_1 and T_2 , respectively. See Table 6.1 for stratigraphic information.

| | parameter | estimate | SE | lower CI | upper CI |
|--|-----------|----------|--------|----------|----------|
| all ozette $r^2 = 0.90928$ n = 230 | y_1 | 44.664 | 1.338 | 42.028 | 47.300 |
| | y_2 | 91.127 | 0.597 | 89.951 | 92.303 |
| | a | 0.248 | 0.083 | 0.084 | 0.411 |
| | b | -0.737 | 1.262 | -3.223 | 1.749 |
| Units I-III $r^2 = 0.94793$ n = 10 | y_1 | 48.439 | 6.487 | 32.567 | 64.312 |
| | y_2 | 94.664 | 5.054 | 82.296 | 107.032 |
| | a | 0.123 | 0.721 | -1.640 | 1.886 |
| | b | 0.309 | 10.906 | -26.377 | 26.996 |
| Unit IV $r^2 = 0.92327$ n = 28 | y_1 | 43.425 | 3.853 | 35.473 | 51.377 |
| | y_2 | 93.379 | 1.617 | 90.042 | 96.716 |
| | a | 0.224 | 0.204 | -0.196 | 0.645 |
| | b | -0.368 | 2.970 | -6.498 | 5.763 |
| H2 & VtV $r^2 = 0.90802$ n = 58 | y_1 | 42.605 | 3.244 | 36.101 | 49.110 |
| | y_2 | 91.525 | 1.283 | 88.953 | 94.096 |
| | a | 0.199 | 0.171 | -0.144 | 0.542 |
| | b | -0.135 | 2.499 | -5.145 | 4.875 |
| H3 & VtVI $r^2 = 0.91887$ n = 34 | y_1 | 45.747 | 2.890 | 39.844 | 51.650 |
| | y_2 | 88.157 | 1.629 | 84.830 | 91.483 |
| | a | 0.530 | 0.359 | -0.203 | 1.263 |
| | b | -4.218 | 5.069 | -14.571 | 6.135 |
| H5 and VtVII $r^2 = 0.92244$ n = 50 | y_1 | 44.832 | 3.070 | 38.652 | 51.011 |
| | y_2 | 90.394 | 1.044 | 88.292 | 92.496 |
| | a | 0.221 | 0.140 | -0.061 | 0.504 |
| | b | -0.020 | 2.268 | -4.585 | 4.544 |
| H1 & VXM $r^2 = 0.89476$ n = 50 | y_1 | 42.554 | 4.318 | 33.862 | 51.246 |
| | y_2 | 93.243 | 1.906 | 89.405 | 97.080 |
| | a | 0.015 | 0.200 | -0.388 | 0.418 |
| | b | 2.285 | 2.942 | -3.638 | 8.207 |

Table 6.2, continued.

| | parameter | estimate | SE | lower CI | upper CI |
|--|----------------------|-----------------|-----------|-----------------|-----------------|
| all reference r² = 0.94919 n = 405 | y₁ | 36.867 | 0.488 | 35.908 | 37.826 |
| | y₂ | 95.020 | 0.447 | 94.141 | 95.898 |
| | a | 0.001 | 0.022 | -0.043 | 0.044 |
| | b | 3.245 | 0.199 | 2.854 | 3.637 |
| pop min r² = 0.91206 n = 156 | y₁ | 34.339 | 5.880 | 22.721 | 45.956 |
| | y₂ | 100.610 | 0.982 | 98.670 | 102.551 |
| | a | -0.283 | 0.122 | -0.524 | -0.041 |
| | b | 5.697 | 1.332 | 3.065 | 8.329 |
| pop max r² = 0.94533 n = 161 | y₁ | 37.417 | 0.947 | 35.546 | 39.289 |
| | y₂ | 93.045 | 0.654 | 91.753 | 94.337 |
| | a | -0.193 | 0.061 | -0.313 | -0.073 |
| | b | 5.246 | 0.702 | 3.859 | 6.633 |

Table 6.3 Regression statistics, by stratum, describing the relationship between age estimation based on tooth sections and age estimation based on calibration of mandible length. See Table 6.1 for stratigraphic information.

| Unit | n | regression coefficient | r^2 | SE of regression | lower CI | upper CI |
|--------|-----|------------------------|-------|------------------|----------|----------|
| I-III | 10 | 0.778 | 0.902 | 0.039 | 0.689 | 0.867 |
| IV | 28 | 0.749 | 0.870 | 0.025 | 0.698 | 0.799 |
| H2 | 58 | 0.702 | 0.851 | 0.020 | 0.662 | 0.741 |
| H3 | 34 | 0.672 | 0.837 | 0.023 | 0.625 | 0.720 |
| H5 | 50 | 0.678 | 0.867 | 0.020 | 0.638 | 0.719 |
| H1/VXM | 50 | 0.722 | 0.894 | 0.019 | 0.684 | 0.761 |
| all | 230 | 0.703 | 0.862 | 0.009 | 0.685 | 0.722 |

Table 6.4 Regression statistics describing the relationship between age estimated from tooth annuli and corrected age estimation based on calibration of MSL using the Ozette VB growth curve. Regressions were calculated separately with estimates for the intercept and forcing the regression through the origin.

| | <i>estimate</i> | <i>standard error</i> | <i>t stat</i> | <i>p-value</i> | <i>lower 95%</i> | <i>upper 95%</i> |
|--|-----------------|-----------------------|---------------|----------------|------------------|------------------|
| full model n = 209 $r^2 = 0.817$ | | | | | | |
| intercept | 0.278 | 0.196 | 1.421 | 0.157 | -0.108 | 0.664 |
| slope | 0.953 | 0.031 | 30.414 | < 0.001 | 0.891 | 1.015 |
| through origin n = 209 $r^2 = 0.815$ | | | | | | |
| intercept | 0.000 | n.a. | n.a. | n.a. | n.a. | n.a. |
| slope | 0.992 | 0.015 | 66.616 | < 0.001 | 0.963 | 1.021 |