News and Views

Research Trends in Human Osteology: A Content Analysis of Papers Published in the *American Journal of Physical Anthropology*

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ABSTRACT This paper explores recent research trends in human osteology, based on articles published in the *American Journal of Physical Anthropology* (AJPA) during two 5-year intervals: 1980–1984 and 1996–2000. Topical "visibility" is measured in terms of article counts; "impact" is estimated through citation indices. Our results indicate that human osteologists continue to publish a range of methodological, analytical, and descriptive research papers that address a broad array of subjects. Analytical articles are cited more frequently than descriptive articles and thus have higher impact, reflecting the discipline's continued commitment to problem-oriented research. Differences in publication patterns exist between scholars during early and later stages of their careers. Articles published by students and Ph.D.s within 2 years of their doctoral degree are more frequently descriptive than analytical, when compared to people with longer career histories. Topics such as pathology, forensic anthropology, and biodistance modeling remain highly visible, while articles on the dentition have waned. An increase in functional research directed toward the postcranial skeleton is also reflected in our data. While continued visibility for morphological investigations is apparent, the impact of recently developed applications in bone chemistry and molecular anthropology is amply documented in our data, particularly during the more recent survey years. Am J Phys Anthropol 128:98–109, 2005.

It is common for scientific disciplines to evaluate research trends through analyses of publications in their flagship journals. There are many purposes for such studies. For physical anthropology, content analyses have been useful in discerning temporal changes in topical foci and evaluating the balance between method and theory (e.g., Armelagos and Van Gerven, 2003; Buikstra et al., 1990; Lasker, 1970; Lovejoy et al., 1982; Simon, 1950). Previous content analyses investigated, for example, the relative publication visibility of primatological, paleoanthropological, and human osteological research papers (Lovejoy et al., 1982), and in so doing, helped define core interests of biological anthropology as a whole. Other studies focused on restricted issues: the race concept (Armelagos and Van Gerven, 2003; Lovejoy et al., 1982), the relative visibility of simple description vs. hypothesis testing (Armelagos and Van Gerven, 2003), the balance between holistic and particularistic studies (Borofsky, 2002; Calcagno, 2003), gender-specific research subjects (Fedigan, 1994), and the relative visibility of secondary topical interests (Buikstra et al., 1990, 2003).

In this paper, we evaluate current publishing trends in human osteology and bioarchaeology, a research focus that has assumed increased prominence in recent decades (Buikstra, 1977; Larsen, 1997; Armelagos, 2003). This appraisal is timely, as a number of factors, both internal and external to the field, are hypothesized to have affected the nature and quantity of osteological research. Centennial retrospectives that discuss these factors were recently offered by Armelagos and Van Gerven (2003) and Buikstra et al. (2003), both of which inspired the current study. Armelagos and Van Gerven (2003) used counts of bioarchaeological articles published in the *American Journal of Physical Anthropology* (AJPA) to document a resurgence of nontheory-driven research during the last decade, the distinction being drawn between theoretical articles (which propose and test hypotheses within an anthropological framework) and descriptive articles (everything else). The conclusion by Armelagos and Van Gerven (2003) that human osteologists are reverting to safe, yet descriptive, research forms the core of their pointed critique, and provides one major stimulus for the present reappraisal. Buikstra et al. (2003) used article counts in five anthropology journals (*American Anthropologist*, *American Journal of Physical Anthropology*, *Current Anthropology*, *Journal of Forensic Sciences*, and *International Journal of Osteoarchaeology*) to detail changes in topical interest within bioarchaeology and forensic anthropology over the last century. Buikstra et al. (2003) offered a more broadly inclusive overview by virtue of the temporal depth sampled and the diverse ven-

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ues that characterized their sample. As a result, their conclusions were more general in nature. Their primary concern was in reestablishing cross-disciplinary visibility to bioarchaeology's and forensic anthropology's contributions. Both studies used visibility (article counts) as the variable of inference.

The content analysis reported here expands on previous studies to explore further recent publishing trends within bioarchaeology. We offer three novel contributions. Firstly, we partition the concept of "visibility," as measured by article counts, from "impact," as measured by the number and rate of citations an article experiences. Consideration of article impact offers a unique perspective that previous content analyses did not consider, and thus allows us to differentiate what bioarchaeologists are publishing, from what both they themselves and other researchers (both in anthropology and in other disciplines) find most useful. Secondly, we distinguish between publication practices of "early career" scholars, students, and individuals within 2 years after their doctoral degree, and established professionals, i.e., postgraduates who postdate their doctoral degree by 3 or more years. The addition of this demographic variable allows us to parcel the effects of author life history on visibility and impact. Using the distinctions between impact and visibility and between early and late career scholarly activity, we are able to reevaluate potential causes of descriptive resurgence with renewed appreciation for mitigating variables. Thirdly, we enumerate trends in analytical material choices, a variable previous authors did not consider. Although human skeletal material provides the corpus of bioarchaeological data, innovations in chemical and molecular technologies have altered the countenance of skeletal biology. We are particularly interested in documenting the effects of these technologies on morphological research practices, and in recording changes in material choices among morphologists (differential use of cranial, dental, and postcranial data sets).

Bioarchaeological research articles were identified for two 5-year intervals in the *American Journal of Physical Anthropology*: 1980–1984 and 1996–2000. The data matrix consisted of seven variables for each article: analytical or descriptive; methodological or nonmethodological; morphological or nonmorphological (chemical or biomolecular) analysis; whether morphological articles used cranial, dental, or postcranial data; research topic; number of citations; and professional standing of the primary author. Using these data, we enumerate the following:

1) Visibility of papers authored by students and individuals within 2 years of their doctoral degree;
2) Visibility of analytical or descriptive, and methodological or nonmethodological articles;
3) Visibility of skeletal morphological and biomolecular studies;
4) Visibility of morphological articles subdivided by body region: dentition, cranium, and postcranium;
5) Impact of papers authored by students and individuals within 2 years of their doctoral degree;
6) Impact of analytical or descriptive, and methodological or nonmethodological articles;
7) Impact of skeletal morphological and biomolecular studies;
8) Impact of morphological articles subdivided by body region: dentition, cranium, and postcranium;
9) Visibility of topical foci;
10) Impact of topical foci; and
11) Retabulation of 1–4 and 9 for early and late career scholars independently.

Although our research interests are, in part, exploratory, we are also interested in evaluating hypotheses specific to recently published critiques. Two themes guide our analysis: 1) research impact, as measured by article citation data, reflects research trends more accurately than article visibility; and 2) students and early career scholars publish articles of a different nature than more senior academics. With these themes in mind, we test the following hypotheses:

1) Analytical articles will have significantly greater impact than descriptive articles.
2) Methodological articles will have significantly greater impact than nonmethodological articles.
3) Bone chemistry and biomolecular approaches will have significantly greater impact than traditional morphological methods.

In addition, we offer the following hypotheses regarding early career scholarly research:

1) Early career academics will publish significantly more descriptive articles.
2) Early career academics will publish significantly more methodological articles.
3) Early career academics will have assumed a more visible presence within AJPA over the last two decades.

By including data on career status and article impact, we hope to evaluate further recent content-based appraisals of the discipline and provide new information on the changing appearance of bioarchaeological research. In particular, we propose that bioarchaeology remains committed to theoretical research (as measured by higher impact for analytical articles), while student focus on research of a more descriptive nature, combined with the increasing visibility of early career authors in the pages of AJPA, provides an alternative explanation for the reported increase in atheoretical bioarchaeology (Armelagos and Van Gerven, 2003).

METHODS

Our survey of AJPA publications encompassed all studies of archaeologically derived human remains

(skeletons and mummies). Research based on recent materials was also included if bioarchaeological applications were obvious, e.g., elemental and isotopic studies (Lambert et al., 1982; O'Connell and Hedges, 1999) or ancient DNA (Kolman and Tuross, 2000; Parr et al., 1996). Similarly, growth-related or genetic-phenotypic studies of modern populations were not included unless the article tested methods of direct application to ancient contexts (e.g., Brown et al., 1983; Hassanali, 1982; Jaswal, 1983; Molnar et al., 1983; Richtsmeier et al., 1984; Sharma, 1983; Townsend and Brown, 1982).

Article searches were performed by direct examination of AJPA issues for the two sequences of interest (1980–1984 and 1996–2000). We then acquired article abstracts and citation counts from the Web of Science.[1] The following variables were recorded: first author's name, year of publication, number of times cited, and article title. Information on the degree date and dissertation title for the first author of each article was obtained from Proquest Dissertation Abstracts.[2] Based on titles and abstract content, each article was categorized according to the following categories: 1) analytical/descriptive, 2) methodological/not methodological, 3) student (early career)/postgraduate (late career) at time of publication, 4) material basis of study (cranial, dental, postcranial, chemical, or molecular), 5) morphological (cranial, dental, or postcranial data) or nonmorphological (bone chemistry and biomolecular) basis of study, and 6) general topic (pathology, diet, growth, biodistance, genetics/heritability, anatomy, asymmetry, forensic anthropology, demography, functional anatomy, dental wear, or taphonomy).

We use the same definitions for analytical and descriptive categories as previous workers (Lovejoy et al., 1982; Armelagos and Van Gerven, 2003). Analytical articles are those that "proposed and tested specific hypotheses or . . . addressed issues of process, function, or attempted to place the analysis into a broader theoretical framework" (Armelagos and Van Gerven, 2003, p. 59). Articles were classified as descriptive if they "focused primarily on description, sorting methods, [or] identification without placing the results into a broader theoretical framework" (Armelagos and Van Gerven, 2003, p. 59). However, assigning articles to these categories was not an easy task. A degree of subjectivity was required, a sentiment also expressed by Lasker (1970, p. 3). We found it easier to determine initially whether an article was descriptive, using the above criteria, and if not, then to assign it to the analytical category.

Methodological sex or age assessment papers were considered descriptive by default (despite the implicit hypotheses being tested), as were pathological case studies/differential diagnoses. Papers whose primary focus was exploring new data collection methods and/or testing existing data collection techniques or analyses were classified as methodological, and all others as nonmethodological. Determining whether the primary author was early- or late-career was based on degree dates and dissertation titles. Articles published before attainment of a doctorate and within 2 years of the author's graduation were classified as student-initiated research. Given the time required for review and revision prior to publication, it seems likely that research published 2 years after graduation would have been initiated during formal training. Primary data source determined material basis. For rare cases in which data were extracted from multiple functional systems, the article was divided evenly among categorical sets. The morphological/nonmorphological category was constructed based on the cumulative sums of cranial, dental, and postcranial articles, and chemical and biomolecular articles, respectively. Research topical assignments were straightforward and unambiguous.

Statistical significance was assessed using a variety of standard tests. Fisher's exact test provided the model of inference for 2×2 contingency tables, and chi-squares provided the model of inference for tables with three or more rows. Inferences regarding citation data were evaluated with *t*-tests and ANOVA, depending on the number of levels within the grouping variable. Impact comparisons among articles published in the same year were evaluated using raw citation counts. Because older articles will demonstrate greater impact using this raw measure, we also calculated the rate of citation by dividing the citation count by the number of years since publication (estimated as publication dates subtracted from 2002, the year our research was initiated). This derived figure is not significantly correlated with publication date ($r = 0.089$, $P = 0.088$), and can therefore be used to compare impact among articles with different publication histories. When multiple comparisons were required, Fisher's least significant difference method was used. All statistical calculations were performed with SYSTAT version 10.0.

RESULTS

On description, method, and morphology

Table 1 presents visibility data for the years surveyed, divided by career status, whether an article was analytical or descriptive, and whether an article was methodological. In terms of percentage representation, student contributions in AJPA fluctuate widely by year. Comparing visibility by decade indi-

[1] Web of Science indexes a number of well-known anthropological journals, including *American Journal of Physical Anthropology*, *Journal of Human Evolution*, *International Journal of Osteoarchaeology*, *Anthropological Science*, *Homo*, *Journal of the Anthropological Society of Nippon*, *American Antiquity*, *American Anthropologist*, *Current Anthropology*, and *Man*. The citation data were downloaded in June 2002.

[2] Dissertation Abstracts include a nearly complete listing of US authors; unfortunately, foreign authors were not frequently listed in this indexing database. Information for most foreign authors was obtained from personal correspondence via email.

TABLE 1. Human osteological publication counts

Year	Number of articles (percentage of articles)				
	Student	Postgraduate	Analytical	Descriptive	Methodology[1]
1980	7 (33%)	14 (67%)	11 (42%)	15 (58%)	8 (31%)
1981	6 (33%)	12 (67%)	10 (39%)	16 (61%)	6 (23%)
1982	3 (15%)	17 (85%)	14 (47%)	16 (53%)	12 (40%)
1983	9 (36%)	16 (64%)	12 (33%)	24 (67%)	11 (31%)
1984	7 (33%)	14 (67%)	11 (37%)	21 (63%)	10 (30%)
1996	7 (30%)	16 (70%)	9 (24%)	29 (76%)	16 (42%)
1997	4 (13%)	26 (87%)	22 (52%)	24 (48%)	14 (30%)
1998	7 (32%)	15 (68%)	14 (37%)	24 (63%)	14 (37%)
1999	6 (33%)	12 (67%)	17 (50%)	17 (50%)	9 (26%)
2000	14 (44%)	18 (56%)	20 (56%)	16 (44%)	10 (28%)
1980s	32 (30%)	73 (70%)	58 (39%)	92 (61%)	47 (32%)
1990s	38 (30%)	87 (70%)	82 (43%)	110 (57%)	63 (33%)

[1] Methodological articles are tabulated independently of analytical/descriptive articles. Nonmethodological column has been omitted.

TABLE 2. Counts of publications by year divided by material focus

Year	Number of articles (percentage of articles)					
	Cranial	Dental	Postcranial	Molecular	Chemical	Total
1980	7 (28%)	12 (48%)	5 (20%)	0 (0%)	1 (4%)	25 (100%)
1981	8 (36%)	10 (45%)	4 (19%)	0 (0%)	0 (0%)	22 (100%)
1982	9 (31%)	10 (35%)	8 (28%)	1 (3%)	1 (3%)	29 (100%)
1983	7 (20%)	16 (46%)	11 (31%)	1 (3%)	0 (0%)	35 (100%)
1984	7 (25%)	10 (36%)	10 (36%)	1 (3%)	0 (0%)	28 (100%)
1996	11 (32%)	8 (24%)	13 (38%)	2 (6%)	0 (0%)	34 (100%)
1997	10 (28%)	19 (53%)	5 (14%)	0 (0%)	2 (5%)	36 (100%)
1998	6 (22%)	6 (21%)	12 (43%)	2 (7%)	2 (7%)	28 (100%)
1999	7 (23%)	10 (34%)	12 (40%)	0 (0%)	1 (3%)	30 (100%)
2000	11 (32%)	3 (9%)	16 (47%)	4 (12%)	0 (0%)	34 (100%)
1980s	38 (27%)	58 (42%)	38 (28%)	3 (2%)	2 (1%)	139 (100%)
1990s	45 (28%)	46 (28%)	58 (36%)	8 (5%)	5 (3%)	162 (100%)

cates that student contributions remain stable (30% in the 1980s vs. 30% in the 1990s. Student contributions were highest (44%) in the year 2000, the final year included in our survey. Never did the number of student contributions exceed that for other professionals. In general, these data indicate stability in the ratio of student:professional research publications published in AJPA. Therefore, demographic changes in publishing cohorts cannot be used to explain other research trends.

Percentages of analytical and descriptive articles fluctuate only slightly during the study period. During the 1980s, analytical articles represented 39% of those published, while descriptive articles represented 61%. The 1990 sample shows a slightly altered pattern, with analytical articles comprising 43% and descriptive articles comprising 57%. This change is nonsignificant ($P = 0.509$). It therefore seems that the proportion of analytical and descriptive articles reached an equilibrium that was established in the 1970s (see Lovejoy et al., 1982). The percentage of methodological articles has also remained relatively stable through time (32% in the 1980s vs. 33% in the 1990s; $P = 0.907$). Although the analytical/descriptive labels are mutually exclusive, the attribution of an article as "methodological" is independent of either of these categorical classes. Therefore, we find that the percentage of analytical and descriptive articles has not changed during the last two decades (contra Armelagos and Van Gerven, 2003), and likewise the ratio of methodological to nonmethodological papers also changed very little. Note that methodology never dominates the literature in terms of research visibility, an important consideration, given that osteology is a materials-based discipline with roots in allied analytical sciences.

Table 2 presents article counts subdivided by material basis. During the 1980s, relative visibility figures are: dental, 42%; cranial, 27%; and postcranial, 28%.[3] During the 1990s, however, postcranial research became much more visible (36%), followed by dental and cranial research (both 28%). Therefore, studies of postcrania show increased visibility over time, with a complementary decrease in dental research. The visibility of the cranium remains virtually unchanged. Interpreted this way, one could argue that cranial research is now a minority focus of morphologists. However, interest in the cranium has remained stable (27% in the 1980s vs. 28% in the 1990s), and the shift apparently reflects a move away from dental research (42% in the 1980s vs. 28% in the 1990s) toward functional studies based on the postcranial skeleton (28% in the 1980s vs. 36% in the 1990s). The change in frequency of cra-

[3]Note these percentages do not sum to one because of the inclusion of chemical and molecular articles in their calculation.

TABLE 3. Average number of citations by year

	Analytical				Descriptive					
Year	N	Mean	Median	SD	N	Mean	Median	SD	*t*	*p*-value
1980	11	18.09	16	14.33	15	8.33	8	5.05	2.162	0.052
1981	10	27.10	28	11.08	16	10.63	10.5	6.92	4.216	0.001
1982	14	20.93	17	15.16	16	14.06	8	13.68	1.295	0.207
1983	13	28.46	13	39.67	24	12.29	10	8.19	1.453	0.171
1984	11	22.82	15	19.35	21	11.29	12	7.86	1.897	0.089
1996	9	6.67	6	3.72	29	6.45	5	8.18	0.111	0.912
1997	22	6.14	5	5.99	24	3.88	3	2.68	1.627	0.115
1998	14	5.93	5.5	4.45	24	3.38	3	2.57	1.966	0.065
1999	17	2.71	2	1.80	17	1.65	1	1.94	1.654	0.108
2000	20	1.70	1.5	1.70	16	2.94	2	3.00	−1.474	0.154
1980s	59	23.46	17	22.61	92	11.44	9.5	8.74	3.902	0.000
1990s	82	4.37	3	4.40	110	3.96	3	4.96	0.591	0.554

nial articles is not significant ($P = 0.558$). However, the decrease in dental research is significant at $P = 0.012$, and the increase in postcranial research is only marginally not significant at $P = 0.100$. Therefore, characterizing human osteology as largely descriptive craniometry, as Armelagos et al. (1982, p. 310) alleged a quarter century ago ("anthropologists are still willing to measure skulls at the drop of a hat"), does not pertain today. It seems, rather, that human osteologists make complete use of the skeletal system in their research, with a trend toward increasing interest in the postcranial skeleton.

Collapsing studies of the crania, dentition, and postcrania into a general "morphology" category, and collapsing studies of bone chemistry and biomolecules into a "nonmorphology" category, provide visibility data for these broader research classes. The visibility of morphological research clearly exceeds that of bone chemistry and biomolecular approaches: 94% of studies focused upon direct observation of hard tissue. Nevertheless, nonmorphological approaches have experienced increased visibility during the last two decades, a trend likely to continue. The visibility of bone chemistry tripled (from 1% to 3%), and the percentage of molecular articles more than doubled (from 2% to 5%), over the last two decades. Overall, the percentage of nonmorphological research doubled from 3% in the 1980s to 8% in the 1990s. The reader is reminded, however, to recall the biased nature of our sample (AJPA publications only), and that only DNA studies based on skeletal material were included in our survey. Thus, we conclude that within osteology and bioarchaeology, nonmorphological applications are increasing in frequency but are still overshadowed by more traditional research topics.

Table 3 presents impact data as measured by citation. Articles published in the 1980s varied considerably in impact. Several articles were never cited,[4] and the maximum number of citations was 146 (Ruff and Hayes, 1983). The mean (16) and median (12) for citations-by-article were much more modest. Using citations per year as our measure of citation rate, the maximum rate was .76, with an average of .61 and a median of .60. Two conclusions can be drawn from comparing citation frequencies for analytical and descriptive articles during the 1980s: 1) analytical articles exhibited greater impact variability than descriptive articles ($F = 2.75$, $P < 0.0001$), and 2) analytical articles were cited much more frequently than descriptive articles, despite the high visibility of the latter ($P < 0.0001$). Year-by-year partitioning of the data set reinforces this pattern, although in only one case does the difference between analytical and descriptive citation frequencies reach statistical significance (Table 3).[5]

The 1990s were characterized by much less variability in citation frequency ($F = 1.13$, $P = 0.276$), an unsurprising result. As time progresses, the most influential research continues to be cited, whereas other papers with less impact do not, thus reaching a plateau. The minimum number of citations for the 1990s was 0, and the maximum number of citations was 33 (Parr et al., 1996). The mean (4) and median (3) were much more modest. The maximum citation rate per year was .58, with an average of 0.1 and a median of .08. Comparison of annual analytical vs. descriptive citation counts produced results similar to those for the 1980s. For the years 1996–1999, analytical articles were more frequently cited, with the year 2000 being exceptional in that citation of descriptive articles exceeded that of the analytical category. Interestingly, this was the only year in which analytical articles outnumbered descriptive articles. The year-specific statistical tests were, however, not significant. The single year that approached significance was 1998 ($P = 0.065$), when analytical articles experienced double the citations of descriptive articles. In contrast to the 1980s, the 1990s cohort did not exhibit a significant difference

[4]To reduce bias in future impact research, we do not cite these articles.

[5]It is important to note that the variance differences within the analytical and descriptive cohorts significantly affected these results. There were several additional significant differences when a pooled variance *t*-test was calculated. We prefer the Satterthwaite approximation because the variances for the 1980s samples are vastly different.

TABLE 4. Average number of citations and citation rate for methodological and nonmethodological research

	Methodological			Nonmethodological				
Year	N	Mean	SD	N	Mean	SD	*t*	*p*-value
Citations								
1980s	47	17.45	23.34	103	15.33	12.58	0.584	0.561
1990s	63	5.32	6.14	129	3.56	3.74	2.092	0.039
Combined	110	10.50	16.96	232	8.78	10.58	0.875	0.331
Citations per year								
1980s	47	0.89	1.22	103	0.78	0.64	0.578	0.566
1990s	63	1.26	1.32	129	0.87	0.76	2.114	0.038
Combined	110	1.10	1.29	232	0.83	0.71	2.026	0.045

TABLE 5. Average number of citations for material basis of osteological research[1]

	Cr			D			PC			Morphological		
Year	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
1980s	38	12.34	10.83	58	17.71	13.94	38	19.47	25.14	134	16.69	17.32
1990s	45	3.98	4.61	45	4.47	4.73	58	2.76	2.61	148	3.65	4.03
Combined	83	7.81	9.05	103	11.92	12.72	96	9.38	17.83	282	9.84	13.89

	Chemical			Molecular			Nonmorphological		
Year	N	Mean	SD	N	Mean	SD	N	Mean	SD
1980s	2	23.00	19.78	3	6.67	5.03	5	13.20	13.81
1990s	5	9.20	5.25	8	12.00	10.53	13	10.92	8.70
Combined	7	13.14	11.35	11	10.54	9.43	18	11.56	9.87

[1] Morphological category was populated as sum of cranial (Cr), dental (D), and postcranial (PC) classes; likewise, nonmorphological category was populated as sum of chemical and molecular classes.

TABLE 6. Citation rate for material basis of osteological research[1]

	Cr			D			PC			Morphological		
Year	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
1980s	38	0.62	0.54	58	0.88	0.70	38	1.02	1.32	134	0.85	0.90
1990s	45	0.95	0.84	45	1.02	1.00	58	0.73	0.69	148	0.89	0.84
Combined	83	0.80	0.74	103	0.94	0.85	96	0.85	0.99	282	0.87	0.87

	Chemical			Molecular			Nonmorphological		
Year	N	Mean	SD	N	Mean	SD	N	Mean	SD
1980s	2	1.12	1.01	3	0.34	0.24	5	0.65	0.68
1990s	5	2.25	1.31	8	3.16	1.59	13	2.81	1.50
Combined	7	1.93	1.27	11	2.39	1.88	18	2.21	1.64

[1] Morphological category was populated as sum of the cranial (Cr), dental (D), and postcranial (PC) classes; likewise, nonmorphological category was populated as sum of chemical and molecular classes.

in citation frequency for analytical and descriptive research ($P = 0.554$). Ignoring temporal categories and considering the overall difference in citation frequency between analytical (n = 141, mean = 12.35, SD = 17.67) and descriptive (n = 202, mean = 7.36, SD = 7.86) research also suggests that the former has a greater impact on the discipline. The difference is statistically significant ($P = 0.002$).

Our impact evaluation for methodological research produced results somewhat consistent with those expected. Although methodological papers were cited more frequently in the 1980s, in the 1990s, and in the combined data sets, only the results for the 1990s data set ($P = 0.039$) were statistically significant (Table 4). When citation rate is considered, both the 1990s ($P = 0.038$) and combined ($P = 0.045$) data sets exhibited significant differences. In both cases, the citation rate for methodological papers exceeded that of nonmethodological papers, supporting our hypothesis. The large standard deviations for the methodological cohort suggest significant variability in impact for methodological research, and we suspect that the significant differences are driven by a select few methodological papers with great impact on the discipline.

Citation patterns also document the emerging impact of chemical/molecular approaches and a decline in impact of cranial, dental, and postcranial approaches (Tables 5 and 6). Although the combined data set ANOVA of citation frequency was not significant ($F = 1.286$, $P = 0.275$), and the ANOVA for the 1980s data set was not significant ($F = 1.485$, $P = 0.210$), the results for the 1990s data set were highly significant ($F = 9.16$, $P < 0.0001$). Multiple comparisons tests revealed that bone chemistry research was cited more frequently than postcranial research ($P = 0.002$), and molecular research was cited more frequently than dental ($P < 0.0001$) and

TABLE 7. Article counts by topical focus

	1980s		1990s		%	1980s	1990s	Difference
	N	%	N	%	difference	rank	rank	rank
Pathology	29	24	60	37	+13	1	1	0
Biodistance	*18*	*15*	*23*	*14*	*−1*	*2*	*3*	*+1*
Heritability/genetics	*12*	*10*	*0*	*0*	*−10*	*3*	*12*	*−9*
Forensic anthropology	12	10	36	22	+12	3	2	−1
Functional anatomy	*11*	*9*	*5*	*3*	*−6*	*5*	*7*	*+2*
Growth	10	8	6	4	−4	6	6	0
Anatomy	*9*	*7*	*14*	*9*	*+2*	*7*	*4*	*−3*
Diet	*6*	*5*	*9*	*6*	*+1*	*8*	*5*	*−3*
Asymmetry	*5*	*4*	*3*	*2*	*−2*	*9*	*8*	*−1*
Dental wear	*5*	*4*	*4*	*2*	*−2*	*9*	*8*	*−1*
Demography	*3*	*2*	*2*	*1*	*−1*	*11*	*.10*	*−1*
Taphonomy	*1*	*1*	*2*	*1*	*0*	*12*	*.10*	*−2*
Totals	121		164					

postcranial ($P < 0.0001$) research. When data classes are pooled into morphological (cranial, dental, and postcranial) and nonmorphological (bone chemistry and molecular) classes, the results are similar. The pooled (P = 0.882) and 1980s (P = 0.609) data sets exhibit no significant differences, but the 1990s data set does exhibit significant differences ($P = 0.010$). During the 1990s, nonmorphological articles received three times as many citations as morphological articles.

To explore further the reason for this dramatic shift, we evaluated relative ranks for chemical and molecular articles within their respective years. For example, in 1980, the single nonmorphological article was ranked 14 of 25 articles in terms of citation rank (where first is the most cited article). Comparative data for the 1980s include: 1982, 2 and 13 of 29; for 1983, 29 of 35; and for 1984, 26 of 28. For the years surveyed during the 1990s, the ranks of nonmorphological articles were: for 1996, 1 and 3 of 34; for 1997, 4 and 15 of 36; for 1998, 1, 2, 4, and 7 of 28; for 1999, 2 of 30; and for 2000, 2, 5, 6, and 10 of 34. These data indicate that nonmorphological research in the 1980s ranks in the middle to lower third of the same-year cohort, whereas similar research in the 1990s ranks within the top percentile of the same-year cohort. Molecular and chemical research based on the human skeleton, therefore, has not only increased in visibility, but has also dramatically increased in impact.

This pattern becomes more apparent when temporal effects are controlled. Table 6 presents information on citation rate (per year) for the material bases commonly used in bioarchaeology. Considering first the difference in citation rate for cranial, dental, postcranial, chemical, and molecular research, both the combined ($F = 9.278$, $P < 0.0001$) and 1990s ($F = 14.94$, $P < 0.0001$) data set exhibited significant differences, while the 1980s data set did not ($F = 1.315$, $P = 0.267$). For the combined data set, chemical research had significantly higher rates of citation than cranial ($P = 0.002$), dental ($P = 0.007$), and postcranial ($P = 0.003$) research; molecular research returned similarly small probability values in comparison to the three morphological classes ($P < 0.0001$ for all three comparisons). For the 1990s data set, chemical research had significantly higher rates of citation than cranial ($P = 0.003$), dental ($P = 0.005$), and postcranial ($P < 0.0001$) research; molecular research returned similarly small probability values for the three morphological classes ($P < 0.0001$ for all three comparisons). Combining these five classes into morphological and nonmorphological categories did not change the results. Nonmorphological research experienced significantly higher citation rates for the combined ($P = 0.003$) and 1990s ($P = 0.001$) data set, with no differences noted for the 1980s data set ($P = 0.566$).

Citation count data support our hypothesis that human osteologists value theoretical articles, articles introducing significant new methodologies, and those articles developed within a problem-oriented framework. Despite the continued visibility of descriptive and methodological research in the pages of AJPA, the discipline is clearly sensitive to the significance and impact of theoretically sound, problem-oriented research. Molecular and chemical approaches have both increased in visibility and impact, at the expense of more traditional approaches.

The changing nature of human osteological research

Table 7 presents topical information for the 1980s and 1990s time blocks. During the 1980s, the four most frequent topics were pathology, biodistance, heritability/genetics, and forensic anthropology, with 39% of the sample being composed of pathology and biodistance alone. Following these two subjects was a third grouping consisting of heritability/genetics, forensic anthropology, functional anatomy, growth, and anatomy articles. Discussions of diet, asymmetry, dental wear, demography, and taphonomy were of minor concern.

During the 1990s, the four most visible topics were pathology, forensic anthropology, biodistance, and anatomy, with 51% of the articles focusing on pathology and forensic anthropology. There is a large reduction in articles discussing trait heritability and genetic transmission, a topic with no repre-

TABLE 8. Impact by topical focus[1]

	1980s				1990s					
	Citations/year		Citations		Citations/year		Citations			
Topic	Mean	SD	Mean	SD	Mean	SD	Mean	SD	*t*	*p*-value
Pathology	0.60	0.45	11.72	8.63	0.87	1.01	3.25	4.18	−1.750	0.084
Biodistance	0.67	0.57	13.48	11.69	0.96	1.09	4.74	6.71	−1.138	0.263
Heritability	0.95	0.53	19.50	10.95	0.0	0.0	0.0	0.0		
Forensic anthropology	0.70	0.47	13.43	8.93	1.11	1.06	4.97	6.03	−1.881	0.066
Functional anatomy	1.93	2.17	37.18	41.29	1.17	0.50	4.60	3.05	1.108	0.289
Growth	0.62	0.59	12.64	12.73	0.80	0.70	3.67	2.94	−0.535	0.605
Anatomy	0.32	0.28	6.33	5.03	0.60	0.48	2.64	2.59	−1.699	0.104
Diet	1.12	0.79	22.12	15.77	1.25	1.19	4.35	2.81	−0.363	0.724
Asymmetry	1.46	0.51	29.83	11.32	1.46	1.10	6.67	5.51	0.005	0.997
Wear	1.51	1.34	28.40	24.08	0.78	0.16	2.00	0.81	1.192	0.297
Demography	0.76	0.58	15.33	11.67	0.78	0.76	3.71	4.79	−0.051	0.961
Taphonomy	0.83	0.0	15.00	0.0	0.66	0.47	3.00	2.83		

[1] Sample sizes are identical to those in Table 7. Significance test evaluated citations/year column only. Raw citation data are obviously affected by time since publication and are not meaningful for diachronic comparisons.

sentation in the 1990s block. Only two topics experience increased percentages during the 1990s: pathology at +13% ($P = 0.058$) and forensic anthropology at +12% ($P = 0.018$). All other topical areas decrease in frequency (heritability/genetics at −10% ($P = 0.00003$), and functional anatomy at −6% ($P = 0.041$)), or remain virtually stable (anatomy at −2%, biodistance at −1%, diet at +1%, asymmetry at −2%, wear at −2%, demography at −1%, and taphonomy 0%), with no significant differences noted.

Table 8 presents annual data on impact as measured by citation frequency and citation rate. ANOVAs for the 1980s sample indicated significant differences in both citation frequency ($F = 3.151$, $P = 0.001$) and citation rate ($F = 3.138$, $P = 0.001$) among topical foci. However, similar tests for the 1990s failed to produce significant differences ($F = 1.078$, $P = 0.382$, and $F = 1.554$, $P = 0.110$ for citation frequency and rate, respectively). During the 1980s, the four most frequently cited topical areas were functional anatomy, dental wear, asymmetry, and diet. During the 1990s, the four most frequently cited topical areas were diet, asymmetry, functional anatomy, and forensic anthropology using citation rate as the sorting criterion, and asymmetry, forensic anthropology, biodistance, and functional anatomy using citation frequency as the sorting criterion. If citation frequency is an accurate measure of impact, then the most influential topics are not those most visible in AJPA. The increase in the visibility of forensic anthropology and biodistance is indicative of the trend documented by Armelagos and Van Gerven (2003) and Buikstra et al. (2003). Given that forensic anthropological articles are frequently methodological, this pattern may simply reflect the dominance of methodological impact, as documented above. One should note, however, that differences in article impact measures were not significant for the 1990s sample. In addition, changes in citation rate between the 1980s and 1990s were not significant for all topics, indicating stability in the impact measure through time. Interestingly, those topics that approach significance (pathology and forensic anthropology) both increased in impact and visibility over the period surveyed.

Author life history and career status

Table 9 presents visibility data for early and late career contributors divided by time block for the following categories: analytical/descriptive, methodological/nonmethodological, material basis of study, and research topic. We are primarily interested in documenting the effect of author life history on the trends in visibility presented above. Two comparisons are important: synchronic evaluation of early and late career authors, and diachronic changes in early career publication foci. For the 1980s, 60% of student articles were analytical, compared to 36% of postgraduate articles, a significant difference ($P = 0.032$). For the 1990s, 36% of student-published research was analytical, whereas 58% of postgraduate-published research was analytical, a marginally nonsignificant difference ($P = 0.051$). For temporal comparisons, the change in percentage of analytical research was marginally nonsignificant for students ($P = 0.077$), which is unexpected, given the change from 60% analytical in the 1980s to 36% analytical in the 1990s. For late career authors, there was a significant increase in analytical visibility during the 1990s ($P = 0.006$). Therefore, students published significantly more analytical research in the 1980s, and marginally nonsignificantly less analytical research in the 1990s, and postgraduates, as a cohort, published significantly more analytical research over the time period surveyed. The decline in analytical visibility for early career authors was large in magnitude but not significant according to Fisher's exact test.

Examination of the relationship between career status and interest in methodological research produced few significant results. There was no percentage-based methodological bias between students and postgraduates during the 1980s ($P = 0.999$), and an increased visibility of early career methodological research in the 1990s (students, 46%; postgraduates, 33%) that did not reach statistical signif-

TABLE 9. Article counts by year, author status, topical focus, and material type

	Number (percentage)			
	Student paper		Postgraduate paper	
	1980s	1990s	1980s	1990s
Focus				
Analytical	19 (60%)	10 (36%)	26 (36%)	48 (58%)
Descriptive	13 (40%)	18 (64%)	47 (64%)	35 (42%)
Methodological				
Methodological	10 (32%)	13 (46%)	23 (32%)	27 (33%)
Nonmethodological	22 (68%)	15 (54%)	50 (68%)	56 (67%)
Material				
Chemical	1 (3%)	0 (0%)	0 (0%)	4 (6%)
Cranial	10 (33%)	7 (26%)	13 (19%)	15 (23%)
Dental	14 (47%)	6 (22%)	31 (44%)	24 (36%)
Molecular	0 (0%)	2 (7%)	1 (1%)	0 (0%)
Postcranial	5 (17%)	12 (44%)	25 (36%)	23 (35%)
Topic				
Anatomy	2 (7%)	0 (0%)	2 (3%)	3 (4%)
Asymmetry	2 (7%)	0 (0%)	4 (7%)	2 (3%)
Biodistance	3 (10%)	6 (23%)	10 (17%)	11 (14%)
Demography	1 (3%)	0 (0%)	1 (2%)	5 (7%)
Diet	1 (3%)	0 (0%)	2 (3%)	7 (9%)
Forensic anthropology	0 (0%)	10 (38%)	10 (17%)	9 (12%)
Function	5 (17%)	1 (4%)	4 (7%)	2 (3%)
Growth	4 (14%)	0 (0%)	5 (8%)	0 (0%)
Heritability	2 (7%)	1 (4%)	4 (7%)	4 (5%)
Pathology	5 (17%)	7 (27%)	17 (28%)	30 (39%)
Taphonomy	0 (0%)	1 (4%)	0 (0%)	0 (0%)
Wear	4 (14%)	0 (0%)	1 (2%)	3 (4%)

icance ($P = 0.255$). Temporal evaluations also failed to return significant results. Although there is a large increase in the frequency of methodological papers published by students (from 32% in the 1980s to 46% in the 1990s), this difference does not reach statistical significance ($P = 0.291$). For postgraduates, the percentage representation of methodology is virtually unchanged over time ($P = 0.999$).

Material basis also demonstrated differences related to career status of the author. During the 1980s, students published more cranial research (33% vs. 19%) and less postcranial research (17% vs. 36%) in comparison to postgraduates. Neither of these differences is significant ($P = 0.125$ and $P = 0.062$, respectively). The quantity of dental research was nearly equal for students and postgraduates in the 1980s (47% vs. 44%; $P = 0.830$). There was little overall relationship between career status and material basis ($P = 0.097$) for the 1980s. During the 1990s, students published more postcranial research in comparison to postgraduates (44% vs. 35%; $P = 0.480$), fewer dental papers (22% vs. 36%; $P = 0.227$), and nearly equivalent frequencies of cranial articles (26% vs. 23%; $P = 0.791$). There was a significant overall relationship between career status and material basis ($P = 0.050$) for the 1990s.

Holding career status constant allows us to evaluate temporal differences in material basis between early and late career scholars. In comparison to the 1980s, students in the 1990s focused more on postcrania (+27%) (postcranium dominates forensic anthropology: 31 of 47 total articles) and less on crania (−7%) and teeth (−25%). The change is significant for the postcrania ($P = 0.041$) and dentition ($P = 0.044$), but not for crania ($P = 0.576$). Overall, there was a significant relationship between time period and material basis for students ($P = 0.029$). Postgraduates focused more on cranial (+4%) and chemical approaches (+6%) and less on dental (−8%) and postcranial (−1%) research; however, none of the changes is statistically significant. Overall, temporal change across this dimension of variability is less extreme for late career scholars and not statistically significant ($P = 0.094$), suggesting stability in the material basis of analyses.

Our consideration of topical focus in relationship to author life history adds an informative dimension to this analysis, and provides the most troubling research findings. Comparison of early and late career scholarly activity for the 1980s indicates a marginally nonsignificant relationship between topical foci and author life history ($P = 0.053$). For the 1990s, there is a significant association between these variables ($P = 0.031$), which likely reflects two factors: the high visibility of student-authored forensic anthropology articles, and the large number of 0 cells in the student column indicating a loss of topical breadth in the 1990s student cohort. Isolating career status and considering only temporal changes provides further explanation for this result. For postgraduates, there are large increases in the percentage of pathology, dietary, and demographic papers, whereas all other topics demonstrate minor decreases. Overall, there is not a significant association between time period and topical representation for the late career cohort ($P = 0.073$). Most importantly, however, postgraduates continue to publish across *all* topical foci (with the exception of trait heritability studies), thus maintaining topical

diversity within the field. On the other hand, students show less breadth. Only three topics demonstrate elevated frequencies over time: biodistance (+13%), pathology (+10%), and forensic anthropology (+38%). Most other topics decrease in frequency, and several disappear altogether (anatomy, asymmetry, demography, diet, heritability, and dental wear; function, growth, and taphonomy are represented by a single article each). The association between time period and topical focus for the student cohort is highly statistically significant ($P = 0.0004$).

In combination, the data from Table 9 indicate that students published more analytical research during the 1980s, while postgraduates published significantly more analytical research during the 1990s with a large, but insignificant, decline in the visibility of early career analytical efforts. Students currently tend to focus more on methodological research, but the differences do not reach statistical significance. There is a temporal trend among students toward the use of postcrania rather than dental remains, while postgraduates demonstrate no change in material basis. Finally, students demonstrate a marked decline in topical breadth over the surveyed intervals, with an emerging dominance of forensic anthropology and an almost complete absence of many topics that are, nonetheless, maintained solely by late career researchers. The difference in visibility of research topics between students and postgraduates was significant for the 1990s survey period. These data affirm the results of Armelagos and Van Gerven (2003), but qualify that the observed changes occur *only* among students and recent graduates, and not among postgraduate biological anthropologists.

SUMMARY OF RESULTS

We considered two types of data in this analysis. Counts of articles represent the visibility of a category within the discipline, whereas counts of citations represent the impact that each article is attributed. Several broad conclusions can be drawn from this content analysis of human osteology articles published in AJPA. In terms of article counts (visibility):

1) The frequency of analytical research, student-authored research, and methodological research has not changed significantly through time.
2) Morphology still dominates discussions of human osteology, despite increases in the visibility of molecular and bone chemistry research.
3) Within morphological research, as dental anthropology publication numbers have declined significantly, postcranial research has increased in visibility (not significantly), and cranial visibility has remained constant, but does not dominate the field.

In terms of citation counts (impact):

1) Analytical research was cited significantly more frequently than descriptive research in the 1980s and combined data samples.
2) Methodological articles demonstrated significant increases in citation counts during the 1990s, but not during the 1980s or combined samples. Methodological research also experienced significantly higher citation rates (per year) during the 1990s and for the combined data sample.
3) Molecular and bone chemistry research was cited very heavily, particularly during the 1990s, at the expense of morphological studies.

In terms of changes in topical focus within human osteology:

1) Pathology, biodistance, heritability, and forensic anthropology were most visible during the 1980s, and pathology, forensic anthropology, biodistance, and anatomy were most visible during the 1990s. This suggests a limited change in research interests over the last two decades.
2) During the 1980s, functional anatomy, dental wear, asymmetry, and dietary research had the highest impact, while for the 1990s functional anatomy, forensic anthropology, asymmetry, and dietary research had the highest impact. Visibility and impact do not coincide. The most frequently published topics in the AJPA are generally not those with the highest impact.

Finally, when these variables are considered in light of author life history, an interesting pattern emerges:

1) During the 1990s, students published more descriptive and methodological articles than analytical articles, with an increasing emphasis on postcranial material and a much narrower range of topical areas in comparison to students of the 1980s. Recently, students have published a substantial amount of forensic anthropological research.
2) During the 1990s, postgraduates published significantly more analytical than descriptive articles, with nonsignificant changes in the proportion of methodological articles, and with minimal narrowing of research interests in comparison to postgraduates of the 1980s.

Given these results, we conclude that hypotheses regarding impact patterns were supported. Analytical research, methodological research, and nonmorphological research demonstrated greater impact as measured by citation counts or citation rates for portions of the surveyed data series. Hypotheses regarding early and late career research publication patterns received mixed support. We documented a strong, but nonetheless not statistically significant, trend for increasing student focus on descriptive research, particularly in forensic anthropology. There was not, however, a bias toward methodolog-

ical research among early career scholars. Finally, we did not find evidence for an increase in the visibility of early career research in AJPA.

DISCUSSION

In this paper, we present research on a complex data set to clarify further recent retrospective analyses and critiques of publication practices within human osteology over the last several decades (cf. Armelagos and Van Gerven, 2003; Buikstra et al., 2003). In contrast to the results of Armelagos and Van Gerven (2003), we find little change in the visibility of analytical research during recent years. We documented a 39% and 42% visibility of problem-oriented research for the 1980s and 1990s, respectively, which differ[6] from the percentages reported by Armelagos and Van Gerven (2003) of 22% and 29% for the same years surveyed (Armelagos and Van Gerven, 2003, p. 60). We also compared our data to those reported by Lovejoy et al. (1982), and found that only a single comparison reached statistically significant levels. Lovejoy et al. (1982, their Table 2) reported that 13.5% of articles published in AJPA for the years 1930–1939 were analytical, which is significantly less than for our 1996–2000 ($P = 0.042$) cohort but not our 1980–1984 cohort ($P = 0.079$). All other comparisons of our analytical visibility data with those of Lovejoy et al. (1982) produced insignificant differences. Although based on limited power, the tests of proportions suggest that few temporal statements on descriptive visibility can be made with these data.

Differences between our visibility figures and those of Armelagos and Van Gerven (2003) are even more apparent when considering visibility of methodological research. Our summary indicates little temporal change, from 32% to 33% for the 1980s and 1990s, respectively. Armelagos and Van Gerven (2003) documented a precipitous decline in methodological research, from 43% to 17% for the same time periods. We cannot determine if these are significant differences, because sample sizes were not provided in Armelagos and Van Gerven (2003). We suspect, however, that these differences are not statistically significant. Therefore, despite our best efforts, we were unsuccessful in accurately reproducing their data set, which suggests either considerable interobserver error in these article enumeration studies, or equally as plausible, inconsistent tabulation methods.

Using "impact" as a more salient measure of publishing trends, we found support for the hypothesis that research contextualized within a problem-oriented, theoretical framework would be accorded greater impact because of its broad appeal and significance. This was particularly true for the 1980s cohort, where analytical research received nearly double the citations of descriptive research (23 vs. 11 on average). That these differences were not apparent for the 1990s cohort suggests some lag in the parceling of impact effects. As articles "age," those with greater impact accrue citations, while those of lower impact do not. Our research suggests that, at minimum, interpretation of impact data may be limited to publications greater than 5 years old.

While we continued the tradition of drawing a distinction between analytical and descriptive osteological research (Armelagos and Van Gerven, 2003; Lovejoy et al., 1982), we do not de facto assign a value judgment to this distinction. Instead, we underscore the crucial role that description has played and continues to play in a science based on material remains rather than laboratory experiments. For example, careful and accurate reporting of new fossil finds is just one area where description serves to anchor later theoretical syntheses. Paleopathology is another area where descriptive presentations of case studies form the core of subsequent syntheses and evolutionary interpretations (e.g., Cohen and Armelagos, 1984; Roberts and Buikstra, 2002; Steckel and Rose, 2003). In both cases, synthesis cannot occur without the raw data provided by descriptive reports. Case studies serve an additional function: they represent efforts to replicate previous results, a hallmark of any legitimate scientific endeavor. And with the potential to facilitate the mentoring of students (discussed further below), we view descriptive publications as an essential component of human osteology, rather than a meaningless exercise. The balance between description and hypothesis-testing can thus be viewed as a sign of a maturing science rather than a troubled one.

Recognition of the distinct publication practices of early and late career authors provides one of the more intriguing results of this study. Although student focus on descriptive research did increase during the surveyed period, the results were not statistically significant. However, there was a significant narrowing of research topics among the early career cohort; in particular, forensic anthropology now dominates student offerings in AJPA (38% of all student offerings). Alternative interpretations of this result vary considerably. The most pessimistic would predict that the field is losing topical breadth in the wake of pointed critiques (Armelagos and Van Gerven, 2003). Less apocalyptic positions would emphasize that although forensic anthropology provides significant analytical agendas for seasoned academics, the multiplicity of research problems, from the simple to the complex, also provides concise projects appropriate for student research. Some of the emerging visibility of forensic anthropology is surely market-driven, as there is no denying the popularity of this field (Buikstra, 2002). On the

[6]Our use of the word "differ" is not meant to imply statistical significance. It is striking how our enumeration of methodological research differs from that of Armelagos and Van Gerven (2003), which suggests instability in the definition and delineation of this category. Although we could not formally evaluate these data due to a lack of reported sample sizes, we suspect, given the results of comparisons by Loveyjoy et al. (1982), that our 33% and 32% estimates do not technically differ from those of Armelagos and Van Gerven (2003).

other hand, the broad range of forensic research topics, some requiring sophisticated expertise and others of more narrow range, can clearly be attractive to both the advanced professional and the beginning student. In an increasingly competitive job climate, students may currently be taking advantage of the research opportunities offered by the documented human skeletal collections throughout the country and publishing earlier in their careers. With continued federal efforts to improve undergraduate education and increase undergraduate research involvement, forensic anthropology provides a ready source of manageable projects to which students may have early access. While some of these students may maintain an interest in forensic research throughout their careers, others (including the primary author of this paper) develop additional anthropological interests, i.e., interests less accessible to those beginning their training rather than their professional career. In fact, the student focus upon forensics may be an indirect measure of an increasingly healthy mentoring system within physical anthropology, whereby students conduct publishable research relatively early in their careers. On the other hand, we hope that these data do not foreshadow an emerging emphasis on quantity over quality. While our simple analysis does not warrant overreaction, we caution students to carefully weigh their publication records and strategies. In the absence of clearly defined and balanced research agendas, quantities of descriptive research articles may be of little benefit in their job quest.

Finally, as Buikstra et al. (2003) documented, the visibility of research within any particular journal is affected by myriad factors, and our enumeration of AJPA publications is therefore expected to be subject to some bias. While AJPA remains our flagship journal and thus anchors American physical anthropology, its pages may no longer be a random sample of our ever-diversifying and successful field. Future research in a similar vein may benefit from a more broadly inclusive journal-sampling design.

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