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Self-Citation in Archaeology: Age, Gender, Prestige, and the Self

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Citation analyses in archaeology have detected prestige tactics, shifts in research agendas, and patterns of gender differentiation. This paper focuses on self-citation in archaeology and systematically analyzes the factors that affect rates of self-citation. Self-citation rates in archaeology are significantly higher than in socio-cultural anthropology but are average for a social science with interdisciplinary ties to the physical sciences. Self-citation correlates weakly with the gender of the citing author and the geographic and thematic focus of research, but correlates strongly with the age of the author. Additional analyses reveal partial evidence for the use of self-citation as a prestige tactic. The paper concludes with a discussion of citations to writers close to the author (mentors, friends).

KEY WORDS socio-politics of archaeology; citation analysis; authorship; prestige.

INTRODUCTION

The discipline of citation analysis began in the 1960s with the publication of the *Science Citation Index* and has grown into a field with thousands of published articles and several journals (MacRoberts and MacRoberts, 1989). By gathering information on the quantity of citations received by specific authors, journals, or institutions and by tracking the age of citations, their context, and their volume, among other things, analysts have revealed information about the structure of academic disciplines at multiple scales and have tested wide-ranging inferences about the production of knowledge. Within archaeology, citation studies have confirmed shifts in theoretical paradigms (Sterud, 1978), explored gender inequities (Beaudry and White, 1994; Hutson, 2002; Victor and Beaudry, 1992), and analyzed cross-fertilization between journals (Rosenswig, 2005). However,

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with the exception of comments by Tilley (1990), no attention has been paid to self-citation, in which authors cite their own published works.

In science studies, research on self-citation has focused on whether self-citation is an egotistical pathology or a valid form of scientific communication (Tagliacozzo, 1977), on differences and similarities in self-citation across disciplines and nations (Aksnes, 2003; Snyder and Bonzi, 1998), and on potential correlations between self-citation and factors such as the number of authors, the age of citations, and even cognition (Glanzel *et al.*, 2004). The goal of this paper is to examine self-citation systematically in archaeology in order to see what it says about how the field is structured as a profession. In particular, this study aims to expand our understanding of strategies for gaining prestige (Conkey and Williams, 1991; Paynter, 1983; Tilley, 1989; Wobst and Keene, 1983), to search for gendered ways of doing archaeology (Baxter, n.d.; Gero, 1996; Morrison, n.d.; Nelson *et al.*, 1994), to explore the relationship between seniority and authority, and to reconsider the kind of self that is involved in self-citation. In a more general sense, examining aspects of how authors cite themselves in their own writings provides insight into authorship and author-ity in archaeology. These issues have become more important in recent years given the growing attention to how archaeologists represent the past (Hodder, 1989; Joyce, 2002) and the growth of archaeological fiction written by archaeologists (Conkey, 2002).

This paper begins by documenting the rate of self-citation in archaeology and comparing it to other fields. I then focus exclusively on archaeology papers and explore factors that may explain why some archaeology papers have more self-citations than others. These factors include research topics, geographic area of specialization, total number of citations, gender of citing author and professional age of citing author. Subsequently, this paper explores the possibility that self-citation functions as a prestige strategy. The discussion of prestige strategies underscores the uneasy coexistence of the push to make archaeology more objective (Binford, 1968) and the recognition of archaeology as a field of struggle to produce and reproduce academic capital (Wylie, 1983). The paper ends with data that suggest that future studies of self-citation should consider the author as an extended self caught up in networks that encompass multiple authors.

Self-Citation in Archaeology and Socio-Cultural Anthropology

Self-citation rates range from less than 2% in art history to 17% in neurobiology. In general, humanities have the lowest rates of self-citation while physical sciences have the highest (Snyder and Bonzi, 1998; Tagliacozzo, 1977). What is the rate of self-citation in archaeology and how does it compare with related fields such as socio-cultural anthropology? To address these questions, I examined four archaeology journals and two socio-cultural journals. The sample of socio-cultural anthropology articles came from *American Anthropologist* and *American*

Ethnologist. The sample of archaeology articles came from *American Antiquity*, *Journal of Field Archaeology*, *Ancient Mesoamerica*, and *Southeastern Archaeology* (see the appendix for a discussion of sampling). I chose these four archaeology journals in order to ensure that the sample of archaeological papers was diverse. Two of the journals—*American Antiquity* and *Journal of Field Archaeology*—are of broad scope, addressing a broad readership, while the other two—*Southeastern Archaeology* and *Ancient Mesoamerica*—are devoted to specific geographic regions, thus appealing to specialized audiences. Within the “broad scope” category, *American Antiquity* and the *Journal of Field Archaeology* complement each other well: *American Antiquity* responds to a United States archaeological constituency—it is offered to all members of the Society for American Archaeology—whereas the authors and subject matter in the *Journal of Field Archaeology* are more international. A similar relationship holds between the two regionally based journals: *Southeastern Archaeology* is published by and institutionally affiliated with the Southeastern (U. S.) Archaeology Conference and its contributors are overwhelmingly from the United States, whereas *Ancient Mesoamerica*, published by Cambridge University Press, has contributors from Central America, Europe, and all of North America. The four journals therefore account for a diverse range of scholarship and audiences.

In archaeology articles ($n = 410$), self-citations comprise an average of 8.4% of the total citations per paper (Table I). In socio-cultural articles ($n = 129$), self-citations comprise an average of 5.1% of the total citations per paper ($t = 4.337$, $p < 0.001$, $df = 537$). A number of factors might explain why archaeologists cite themselves significantly more than socio-cultural anthropologists. Though the rates of self-citation in archaeology and socio-cultural anthropology approximate self-citation rates in other social sciences, such as economics (6.5%) and sociology (7.3%), archaeology is at the upper end, tending toward the high self-citation rates in the physical sciences. Likewise, socio-cultural anthropology is at the lower end, tending toward the low self-citation rates in the humanities. These tendencies fit well with the notion that socio-cultural anthropology underwent a “literary turn” in the 1980s (Clifford and Marcus, 1986) and the notion that archaeologists have increased their engagement with the physical sciences since the 1960s.

Table I. Comparison of Self-Citation Rates in Archaeology and Socio-Cultural Anthropology

	<i>n</i>	% Self-citations	Student’s <i>t</i> -test	<i>p</i>
Socio-cultural articles ^a	129	5.1	4.337	<0.001
Archaeology articles ^b	410	8.4		

^aFrom *American Anthropologist* and *American Ethnologist*.
^bFrom *American Antiquity*, *Journal of Field Archaeology*, *Ancient Mesoamerica* and *Southeastern Archaeology*.

Another possible explanation concerns the number of authors. Analyses of other fields have shown a strong correlation between the number of authors and the quantity of self-citation (Aksnes, 2003). The average number of authors for the archaeology papers in the sample is 1.86, whereas the average number of authors per paper in the sample of socio-cultural anthropology papers is 1.15. Although archaeology papers have more authors, there is in fact no correlation in archaeology between the number of authors and the quantity of self-citations (Pearson's $r = 0.035$, $p = 0.48$). Thus, the difference in the number of authors does not account for the difference in the rate of self-citation.

Citation analysts have also suggested that the incrementality of knowledge accounts in part for differences in the rate of self-citation between fields: writers in fields in which current research builds upon and depends fully upon previous research are more likely to cite their previous publications (Snyder and Bonzi, 1998). However, no one has demonstrated that knowledge in archaeology is more incremental than knowledge in socio-cultural anthropology.

Finally, the possibility that archaeologists produce more grey literature than socio-cultural anthropologists and cite it frequently when publishing in peer reviewed journals may help explain why archaeologists cite themselves more often (Mary Beaudry, personal communication, 2005). In other words, whereas authority among socio-cultural anthropologists may depend on literary devices that place the author 'there', in the field (Geertz, 1988), authority among archaeologists may depend upon reference to technical reports. This could be tested by calculating the proportion of self-citations accounted for by such "grey" reports.

Factors Affecting Self-Citation in Archaeology

Why do some archaeology papers have more self-citations than others? In this section I attempt a systematic search for factors that affect the rate of self-citation within archaeology. To determine what factors affect self-citation most strongly, I performed a multiple regression on papers from the four archaeology journals, using the percentage of self-citations in the bibliography as the dependent variable. The independent variables include the gender of the author (assessed on the basis of first name), the professional age of the author (years passed between the year of publication of the paper and the year in which the author received the Ph.D.), the total number of citations in the bibliography, the topic of research, and the geographic focus of research.

Of the five independent variables monitored, only two—age of citing author and total citations—are readily measured in the form of ratio variables. Gender of citing author is a nominal variable with only two states and topic of research and geographic focus are nominal variables with multiple states. I transformed topic of research and geographic focus into a series of dummy variables (with potential states of one or zero) so they could be included in the regression. Thus, for the topic

Table II. Coefficients of the 16 Variables in the Regression Equation

Variable	Coefficient	SE B	Beta
Age of author	0.00245	0.00049	0.278
Total citations	0.00046	0.00011	−0.239
Gender of author	0.00583	0.00928	0.036
American Southwest	−0.00991	0.01534	−0.040
American Southeast	−0.01086	0.01122	−0.064
Maya region	0.01661	0.01071	0.106
Bioarchaeology	0.02380	0.02856	0.046
Chronometrics	0.01390	0.02873	0.027
Economics	0.04783	0.01904	0.146
Gender Archaeology	−0.02985	0.02719	−0.063
Household	−0.00347	0.02018	−0.010
Archaeology			
Lithics	0.00175	0.01429	0.007
Palaeolithic	0.02310	0.02205	0.063
Settlement patterns	0.00093	0.01521	0.004
Sociopolitics	0.00348	0.01422	0.015
Agriculture/palaeobot	−0.01050	0.01634	−0.038
(Constant)	0.07756	0.01477	

Note. “SE B” means standard error of the coefficient, Beta is a statistic that transforms the coefficients of the two normal variables (age of author and total citations) and the fourteen dummy variables into a comparable weighting system. In other words, the size of Beta serves as a proxy for the strength of the relationship between the variable and the dependent variable.

of research, I made a dummy variable for each of the ten most common research topics: sociopolitics, economics, chronometrics, agriculture/palaeoethnobotany, settlement patterns, lithic analysis, ceramic analysis, bioarchaeology, household archaeology, and engendered archaeology. For geographic specialty, I created dummy variables for the three most common regions represented in the four journals: the American Southwest, the American Southeast, and the Maya region of Central America. The multiple regression therefore contained a total of 16 independent variables and a sample of 285 papers, not including reports, book reviews, comments or technical studies (see appendix).

The multiple regression showed that the set of independent variables accounted for only a modest portion of the variation in self-citations ($r^2 = 0.197$). Table II reports the coefficients for each of the 16 variables. The variable that displays the strongest linear relationship with self-citation is the professional age of the author, which is positively correlated with self-citation (Table III; $r = 0.300$, $p < 0.001$, $n = 285$). This correlation might be explained by the possibility that older authors have published more than younger authors and therefore cite themselves more because they have more of their own publications to cite. To evaluate this explanation, future studies should track the number of papers that each author has published and compare this to the rate of self-citation. A second potential explanation is that older authors cite fewer works on the whole, which

Table III. Correlation Matrix Representing Pearson's *r* Correlation Coefficients for 285 Archaeology Articles in *American Antiquity*, *Journal of Field Archaeology*, *Ancient Mesoamerica* and *Southeastern Archaeology*

	% Self-citations	Total citations
Total citations	$r = -.253, p < 0.001$	
Professional age of citing author	$r = 0.300, p < 0.001$	$r = -0.052, p = 0.345$

therefore gives more weight to their self-citations. This explanation can be tested by determining whether or not there is a correlation between professional age of author and total number of works cited. The test revealed no significant correlation (Table III; $r = -0.052, p = .345, n = 285$).

The total number of citations has the second strongest linear relationship with self citation (Table II). Total number of citations is negatively correlated with self-citation (Table III; $r = -0.2531, p < 0.001$). The negative correlation indicates that in papers with longer bibliographies, the percentage of self-citations is smaller than in papers with shorter bibliographies. Nevertheless, the actual quantity of self-citations in longer bibliographies is higher than the quantity of self-citations in papers with shorter bibliographies. To explore this further, I expanded the sample of papers by extending the time span for *American Antiquity* back to 1988 (Table IV). This expanded sample contained 540 papers. I then split this set of 540 papers into those with 50 or fewer total citations ($n = 217$) and those with more than 50 total citations ($n = 323$). In the group with 50 or fewer total citations, 10.3% of all citations were self-citations, whereas in the group with more than 50 total citations, 6.5% of the all citations were self-citations (Table IV; Student's $t = 5.19, p < 0.001, df = 538$). However, in the papers with short bibliographies, the average number of self-citations is 3.0, which is significantly less than the average number of self-citations—5.2—in papers with longer bibliographies (Student's $t = 6.686, p < 0.001, df = 538$).

With regard to gender, recent considerations of the gendered nature of archaeological epistemology (Conkey and Wylie, in press) entail a specific set of expectations. Donna Haraway (1988) notes that feminist ways of knowing are partial and situated. Masculinist ways of knowing, on the other hand, exhibit controlling and totalizing tendencies. Based on ethnographic observations, Joan Gero (1996) suggests that archaeological field techniques also reflect gendered ways of

Table IV. Comparison of Self-Citation Rates in Archaeology Articles with Small and Large Bibliographies

	<i>n</i>	% Self-citations	Student's <i>t</i> -test	<i>p</i>
Articles with >50 cites	323	6.5	5.19	<0.001
Articles with ≤ 50 cites	217	10.3		

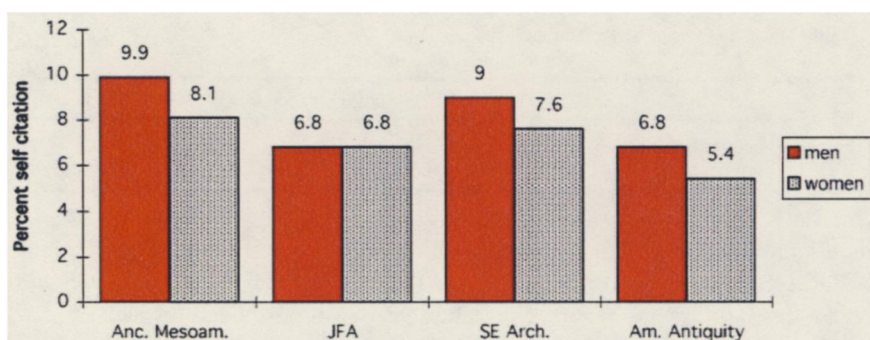


Fig. 1. Bibliographic self-citation rates: men vs. women in four journals.

doing. For example, at a 1992 excavation in Argentina, Gero noted that male crew members confidently drew sharp boundaries around features in archaeological profiles, whereas female crew members recognized a degree of fuzziness in the boundaries between features. The lines in the women's drawings were less bold, expressing ambiguity. Is it possible that archaeological self-citation is similarly gendered? In other words, will men, who supposedly do not notice the ambiguity and subjectivity of their work, cite themselves more often than women, who are said to appreciate contingency and nuance and recognize that personal contributions to debates can only be partial and fragmentary?

The regression shows that gender has no significant effect on self-citation. Nevertheless, I scrutinized the issue more closely by expanding the sample size again to 540 papers, but this time looking at the gender effect one journal at a time. In all four journals, men cite themselves more often than women cite themselves (Fig. 1) but the difference is never statistically significant. In addition to looking at self-citation in the bibliography, I also looked at self-citation within the text of articles. This "within text" method involves counting the number of self-citations made in the body of the paper and comparing this to the total number of citations made in the body of the paper. The rate of citation within the text could be much higher than the rate of citation in the bibliography because a single reference in the bibliography could be cited multiple times in the body of the paper. Since this "within-text" procedure involves scanning the complete body of each paper, it consumes much more time than simply tallying up the citations in the bibliography alone. Therefore, I looked only at *American Antiquity*. I chose *American Antiquity* instead of the other three journals because *American Antiquity*, as the flagship journal of the SAA, has the highest circulation of the four journals and because it has one of the highest impact ratings of all anthropology journals. 'Impact rating' refers to the ratio of citations received by the journal to the number of articles published by the journal. The Institute for Scientific Information (1998–1999) calculates the impact rating for *American Antiquity* but does not do so for the other

Table V. Comparison of Female and Male Self-Citation Rates Within the Text of *Current Anthropology* Comments

	<i>n</i>	% Self-citations	Student's <i>t</i> -test	<i>p</i>
Female <i>CA</i> comment writers	24	23.0	0.264	0.792
Male <i>CA</i> comment writers	86	24.7		

three journals in this study. My sampling strategy involved looking at citations for ‘articles’ (*n* = 43) and ‘reports’ (*n* = 61) published in 1989, 1992, 1995 and 1998 (some articles and reports from these years were excluded for lack of self-citations). The results of this final search corroborated the previous findings: men cite themselves slightly more than women (12.1% as opposed to 11.1% in articles; 14.4% as opposed to 13.1% in reports), but the differences are not statistically significant.

Finally, I tested for the possibility of distinctly gendered self-citation in a fifth venue: comments on archaeology papers in *Current Anthropology* during the 1990s (Table V). I looked at self-citation in comments primarily to explore prestige strategies (see below), but recognized that the data could also be used as an additional test for gendered differences in self-citation rates. In these comments, self-citations within the text of comments written by men (*n* = 86) comprise 24.7% of all citations, compared to 23.0% for comments written by women (*n* = 24). The difference is not significant (*t* = 0.264, *p* = 0.792, *df* = 108).

In summary, no lines of evidence suggest any difference in self-citation practices between male and female authors. These findings therefore do not support expectations derived from Haraway’s discussion of the difference between masculine and feminine ways of knowing.

Among the topical specializations, economics showed the strongest linear relation to self-citation (see Table I). Thus, authors writing about ancient economies tend to cite themselves much more often than authors writing, for example, about ceramics or gender. A *t*-test between papers on ancient economies (*n* = 15) and all others (*n* = 270) also calls attention to the comparatively high rate of self citation in papers on ancient economies (*t* = 1.877, *p* = 0.062). Geographic specialization did not affect self-citation in any significant way.

Self-Citation as a Prestige Tactic

In 1968, Lewis Binford (1968, p. 16) lamented that one of the two major criteria for evaluating statements about the archaeological record was “the degree to which we might have confidence in the professional competence and intellectual honesty of the archaeologist advancing interpretations.” Binford (1968, p. 17) argued instead that “The yardstick of measurement is the degree to which propositions about the past can be confirmed or refuted through hypothesis testing—not

by passing judgment on the personal qualifications of the person putting forth the propositions” (see also Redman, 1991, p. 296). The idea that the identity of the author should not influence the evaluation of arguments aligns archaeology with traditional understandings of the natural sciences. Beginning in the seventeenth century, a scientific work (as opposed to a literary work) no longer needed an author to be taken seriously or to guarantee its entrance into learned discourse (Foucault, 1979). The work’s objectivity—its separation from its subjective origin and its originator—redeemed and continues to redeem it. The identity of the author is superfluous because the data are said to speak for themselves (cf. Latour, 1994, p. 794).

However, the fact that science is a social practice challenges the ability to separate ideas from authors. In defining its boundary as a discipline, archaeology carves a space in which only some people (those with proper training) can speak and only certain things can be said (others are unthinkable and inadmissible). Archaeology, like any other social practice, is “the locus of a struggle to determine the conditions and the criteria of legitimate membership and legitimate hierarchy” (Bourdieu, 1988, p. 11). Archaeologists struggle over ‘scientific capital’—“a composite of competence and authority which is built up by controlling the production of scientific knowledge” (Wylie, 1983, p. 120; see also Hutson, 1998).

Citation analyses provide a potential avenue for documenting the struggle for prestige and scientific capital. Citation, the practice of connecting/restricting an idea to a specific author, connects closely to the system of rewards since the number of citations received by the author correlates with that author’s importance and prestige (Hamermesh *et al.*, 1982). To gain citations is therefore to gain academic currency. Authors who accumulate many citations can “exchange” this currency for higher salaries and other benefits (Lutz, 1990, p. 618). This is why some citation analysts (Aksnes, 2003; MacRoberts and MacRoberts, 1989) caution against the use of citation counts as a measure of academic currency: excessive self-citation inflates an author’s citation counts, thus artificially raising the perceived influence of the author’s publications.

Wobst and Keene’s (1983) comments on research cones prefigure a different way by which self-citation plays into prestige tactics. For example, by appending a citation of one’s own work to the end of a concept of sweeping importance, a writer can jockey for personal affiliation with the concept, placing oneself at the tip of a research cone (see also Conkey and Williams, 1991). If the author is successful, a ‘citation tollbooth’ might form, obliging future authors engaged in the same topic to cite the original author as if paying a toll (Becher and Trowler, 2001, pp. 59–60; Foucault, 1981, p. 64). The more important the concept, the more tolls collected.

Although discussion of citation tollbooths and systems of rewards casts the field in a negative light, this is not a criticism of archaeology nor archaeologists because these same features create a certain order without which archaeology could not exist as a discipline. If archaeology as a discipline is “controlled, organized,

selected and redistributed by a certain number of procedures whose role is to ward off its powers and dangers, to gain mastery over its chance events, to evade its ponderous, formidable materiality” (Foucault, 1981, p. 52), then citation is one of these “procedures.” Citation brings the archaeologist into professional existence by garnering the kind of academic currency that supports a career while at the same time fixing and limiting meaning to previous references and things already said (cf. Joyce, 2002). Though these procedures seem to restrict what archaeologists say and how they say it, they also enable and empower archaeologists by establishing order, giving them a voice (author-ity), and staking out archaeology’s ground from that of other disciplines.

Testing whether or not self-citation functions as a prestige tactic cannot rely on general tabulations of the quantity of self-citations. Rather, it requires examining the context of where self-citations occur (Snyder and Bonzi, 1998; Taglicozzo, 1977). In this section, I test three predictions entailed by the hypothesis that self-citation is used strategically. First, I predict that self-citation will occur more often in forums with broader readership and in topics with broader scope. In these contexts an author’s previous work can be promoted to the largest possible audience. This prediction can be tested by comparing the number of self-citations in the two journals of broad scope (*American Antiquity* and the *Journal of Field Archaeology*) with the two journals of regional scope (*Ancient Mesoamerica* and *Southeastern Archaeology*). *American Antiquity* is a particularly good venue for examining prestige tactics because it is one of the two flagship journals of the Society for American Archaeology and, as noted above, because it has one of the highest impact ratings of all anthropology journals (Institute for Scientific Information 1998–1999). The test (Table VI) shows that there is no significant difference in the rate of self-citation in the two types of journal ($t = 0.560, p = 0.576, df = 409$). The mean percentage of self-citations for the two broad-scope journals is 8.1% ($n = 160$); for the regional-scope journals it is 8.5% ($n = 251$).

The prediction that self-citation will be higher in venues of broader scope can also be tested by comparing the number of self-citations between “articles” and “reports” in *American Antiquity*. Regardless of whether or not authors request

Table VI. Comparison of Self-Citation Rates in Publication Venues of Broad and Less Broad Scope

	<i>n</i>	% self-citations	Student’s <i>t</i> -test	<i>p</i>
Broad scope journals ^a	160	8.1	0.560	0.576
Regional scope journals ^b	251	8.5		
<i>American Antiquity</i> articles ^c	43	11.9	0.810	0.420
<i>American Antiquity</i> reports ^c	61	14.1		

^aIncludes *American Antiquity* and *Journal of Field Archaeology*.
^bIncludes *Ancient Mesoamerica* and *Southeastern Archaeology*.
^cThe self-citations are tallied from within the text as opposed to in the bibliography.

that their manuscripts be categorized as reports or articles, the editorial board regards articles as being of broader scope than reports (Reid, 1990, p. 449). For this test, I tallied self-citations within the text as opposed to in the bibliography. As mentioned above, the “within-text” method is more time consuming and was therefore not deployed in the other three journals. Nevertheless, the “within-text” method adds more resolution to the study of self-citation as a prestige tactic because the number of times a work is cited within the text is a more accurate measure of the amount of exposure authors give to their publications (Snyder and Bonzi, 1998). Publications cited in the bibliography are not easily noticed unless authors activate them by referencing that publication frequently within the text. I looked at citations for articles ($n = 43$) and reports ($n = 61$) published in 1989, 1992, 1995 and 1998. The results of the test (Table VI) show that authors of reports cite themselves slightly more often than authors of articles (14.1% compared to 11.9%), but the discrepancy is not significant ($t = 0.810$, $p = 0.42$, $df = 120$).

Thus, the first prediction entailed by the hypothesis that self-citation works as part of prestige tactics has been rejected in two separate encounters with my data. The rate of self-citation in venues with a more general audience is the same as that in venues with a more specialized audience.

A second testable prediction entailed by the hypothesis that self-citation is used strategically is that younger authors in academia will cite themselves more because they have not yet stabilized their position in the discipline and are therefore most affected by the struggle for academic currency. For example, compared to tenured professors, untenured professors or recent Ph.Ds. seeking jobs may need to concern themselves more with promoting their work. As presented in the previous section, my data do not support this prediction because older authors cite themselves more than younger authors. However, I do not yet consider this prediction rejected because, as discussed above, the reason that older authors cite themselves more than younger authors might be that old authors have published much more and have more of their own work to cite.

A third testable prediction entailed by the hypothesis that self-citation is used strategically is that authors will cite themselves within the text more often than in the bibliography. This occurs in a case where, for example, self-citations comprise one tenth of a given bibliography but comprise one fifth of the citations within the text of the article. Such discrepancies would indicate that within the text, authors are disproportionately highlighting their own publications compared to other works in the bibliography. This disproportionate highlighting of one’s own work may indicate the presence of a prestige tactic (see Tilley, 1990), whether or not the author consciously intends it. As noted above, I examined “within-text” citations only in *American Antiquity* due to time constraints.

For both articles and reports published in *American Antiquity* in 1989, 1992, 1995 and 1998, authors cite themselves within the text almost twice as frequently as in the bibliography (Table VII). For example, in the bibliography of articles, one out of every fifteen references (6.5%) is a reference to one of the author’s

Table VII. Comparison of Self-Citation Within Bibliography and Within Text

	<i>n</i>	% Self-citations in bibliography	% Self-citations within the text	Student's <i>t</i> -test (paired)	<i>p</i>
<i>American Antiquity</i> articles	43	6.5	11.9	4.210	<0.001
<i>American Antiquity</i> reports	61	8.3	14.1	4.406	<0.001
<i>American Antiquity</i> comments	37	9.5	23.2	4.715	<0.001

own publications. However, in the text of those articles, one out of every eight citations (11.9%) is a self-citation. This difference is statistically significant (paired $t = 4.2103$, $p < 0.001$, $df = 42$). For reports, the comparison is 8.3% vs. 14.1%, also statistically significant (paired $t = 4.046$, $p < 0.001$, $df = 60$). In comments—when a writer is responding directly to a previous paper (see Appendix)—the discrepancy between self-citations in the bibliography and self-citations in the text is highest: 9.5% vs. 23.2% (paired $t = 4.715$, $p < 0.001$, $df = 36$).

Thus, if elevated self-citation rates within the text of papers are seen to reflect a prestige tactic, the high within-text citation rates in *American Antiquity* indicate a prestige tactic in archaeology. Alternatively, if an author's previous works are central to the current work and works published by other authors merely provide a background, then we would expect a high within-text self-citation rate regardless of whether prestige tactics are in operation. Therefore, the data for this third testable prediction are equivocal.

The very high rate of self-citation in comments draws attention to prestige tactics of a different sort. Almost one in every four references (23.2%) within the text of comments is a self-citation. To try to understand this abnormally high figure, I explored self-citation in a second venue for comments: *Current Anthropology*. An important difference between these two venues for comments is that the editors of *Current Anthropology* solicit comments from recognized authorities, whereas in *American Antiquity*, comments are volunteered without solicitation from the editors. Citation analysis manifests this difference.

In 217 archaeological comments published in *Current Anthropology* in the 1990s, self-citations within the text comprise 25.1% of the total "within-text" citations. Thus, comment writers in *Current Anthropology* and *American Antiquity* cite themselves at similar rates. Yet in *Current Anthropology*, those who cite themselves in comments tend to have been cited as authorities in the text of the original articles on which they have been invited to comment. In a sub-sample of 131 comments in *Current Anthropology*, commentators cited themselves 297 times but these same commentators were cited 479 times by the authors of the original articles. This indicates that *Current Anthropology* comment writers are licensed to cite their own work because their own work was heavily referenced in the original discussion. In *American Antiquity*, however, the commentators were not cited as often in the text of the original articles. Though the 37 commentators made 276

citations to themselves, they received only 104 citations from the authors of the original articles. This suggests that comments in *American Antiquity* are written by those who seek to be included in discussions from which their own contributions were originally excluded. This type of behavior is a clear manifestation of strategic attempts to make sure one's contributions get noticed.

Citation and the Self

In conducting this research, I noticed that authors made many citations to professors and fellow grad students from their Ph.D. granting institutions. This chance finding caused me to re-consider the nature of the "self" in archaeological authorship. Thus far I have presumed that the self extends no further than the author making the citations. Thus, a self-citation is defined strictly as a citation bearing the same name as the author. Yet what if the self is instead considered a relational entity (Leenhardt, 1979 [1947]; Strathern, 1988)? In other words, what if the input from and relationships to one's colleagues or advisors become part of one's professional identity as an archaeologist? What if one's sense of academic selfhood extends to mentors, collaborators in the field, and fellow students at graduate school? Insofar as a mentor has a formative influence on an archaeologist's intellectual identity, a citation to that mentor might be considered a citation to oneself. Thus, a much more extensive definition of self-citation may be required. An extended, relational self-citation might be just as strategic as a strictly defined self-citation because promotion of authors who share the same intellectual genealogy as oneself is also a promotion of the self.

For the most part, these comments remain in the realm of speculation because it is very difficult to track the extended self in citations. Such tracking requires research into where the author received degrees, who studied alongside the author, which professors advised the author, which archaeologists collaborated with the author on field projects, etc. Once this research is complete, the citations must be tallied and categorized on the basis of the categories created. The whole process must then be repeated for each paper, therefore making it very time-consuming to build a sample of papers that definitively addresses the notion of the relational self. Nevertheless, one of the papers which engendered this direction of inquiry as well as the present paper reveal some intriguing information about the extended self. The paper that caught my attention contained 685 total citations within the text. Of the 685 citations, 72 were self-citations (10.5%). The paper also contained 68 citations to the author's graduate advisor, 30 citations to other graduate school mentors, 87 citations to other archaeologists who graduated from the same institution, and 15 citations to colleagues who collaborate on work in the same archaeological sub-region. Adding all these together yields a total of 272 citations to the "extended self," comprising 39.7% of the total citations, and 52.0% of citations to archaeological works (272 of 523). In comparison, the present paper on

self-citation in archaeology contains 71 citations within the text. Of those, two are self-citations in the strict sense, yet an additional 10 citations are to my mentors or collaborators, which means that roughly a sixth (16.9%) of my citations can be attributed to my extended self.

I reiterate that these data are too few to yield firm conclusions. Making a point about the extended self requires analyzing more than two papers. Nevertheless, I believe the data from these two papers suggest that a more thorough study is worthwhile. Very high rates of citation to the extended self can be a cause for concern. If the act of citation creates dialogues between the author and other voices (Joyce, 2002), and if archaeological writing should move toward including multiple voices, given that many constituents have a stake in the past (Conkey and Tringham, 1996; Layton, 1989; Lowenthal, 1990; Rountree, 2001; Swidler *et al.*, 1997; Tringham and Conkey, 1998; Watkins, 2000), then a high rate of citation to the extended self means that many of the voices in archaeological dialogues are “inside” voices and therefore not as engaged with others. Furthermore, a high rate of citation to the extended self renders scholarship less intersubjective. When the proportion of citations to the inside group increases, there is less room for independent voices in the dialogues between the author and the works cited. If intersubjectivity strengthens the rigor and objectivity of academic work by opening discourse to independent voices (Barnes, 1985, p. 23; Harding, 1991, p. 143), then high rates of self-citation make archaeological writing less intellectually robust.

CONCLUSION

The data and analysis presented above illustrate a number of features about self-citation in archaeology. Archaeologists cite themselves more often than socio-cultural anthropologists. Common explanations for differences in self-citations between fields, such as the number of authors, fail to explain the discrepancy between archaeology and socio-cultural anthropology. The discrepancy may relate to the different cross-disciplinary engagements of the two subfields or to the quantity of grey literature in archaeology.

Within archaeology, my attempts to understand the variation in self-citation rates among different papers succeeded in accounting for about a fifth of the variability. The strongest observed trend is that older authors cite themselves more than younger authors. The notion that older authors have had the time to publish more work and therefore cite that work might explain this trend. This explanation entails a testable prediction that future studies can explore by controlling for the amount of work that each author has published.

The gender of the author has no effect on the number of self-citations. Regional specializations as well as research topics, with the minor exception of economics, also have little effect on the rate of self-citation. These results are not surprising. Though there may have been reason to anticipate gendered effects

on self-citation (Gero, 1996), there are no good reasons to expect that the topic or region of the world in which a person works will affect the rate of self-citation. Additionally, authors writing in journals that specialize in a specific region cite themselves at the same rate as authors who submit their work to journals of broader scope. Future researchers may want to determine whether the same relation holds for journals specializing in particular topics.

Since I have shown in this paper that gender, region, and topic have little bearing on the number of self-citations, much of the variability in self-citation rates remains unexplained. A different line of argument presented in this paper concerns the contention that self-citation relates to prestige tactics. Though archaeologists have multiple reasons for doing archaeology, archaeology is a career. Like many other careers, success in archaeology requires performance and prestige. Self-citations can be seen as a method to gain prestige insofar as they increase the author's citation counts and publicize and promote an author's research accomplishments. In this paper, I tested several predictions entailed by the hypothesis that authors use self-citation as a prestige tactic. An important finding is that archaeologists cite themselves within the body of the text much more often than would be expected, given the proportion of self-citations in the bibliography. Additionally, the high self-citation rates in comments in *American Antiquity* suggest that a motivation of comment writers is not simply to enlighten the discourse but to get their own work included in discussions where it was originally left out. Though this suggests that certain authors indeed deploy prestige tactics, it remains equivocal as to whether archaeologists in general use self-citation strategically.

Finally, preliminary data indicate, perhaps unsurprisingly, that a large portion of citations are to writers that have close connections to the author. This suggests that the "self" in "self-citation" might be a relational self, and therefore deserves further research. This research could center on identifying "citing circles" that result from patterned yet contingent personal relations with colleagues, as shaped by the author's academic biography.

APPENDIX: DISCUSSION OF SAMPLING METHODS AND SAMPLE SIZES.

The sample of papers from *American Anthropologist* includes socio-cultural articles from issues 2 and 4 of 2001, issues 1 and 2 from 2002 all issues from 2003, and issues 1, 2, and 3 from 2004. The sample includes 74 papers. Ten of these articles could be classified as linguistic anthropology. Archaeology and physical anthropology papers appearing in these issues of *American Anthropologist* were not included. From *American Ethnologist*, I used articles from 2002 and 2003. This sample includes 55 papers. From *American Antiquity*, I used articles (not including "comments," "reports" or "book reviews") from one issue in 1997 and all issues from 1998 to 2000. This yielded a sample of 35 articles. That the articles

from *American Antiquity* and the other archaeology journals come mostly from the 1990s and the socio-cultural articles come from the 21st century resulted from the fact that the data on socio-cultural articles was gathered during revisions made to the paper a few years after the research on the archaeology articles was completed. For the *Journal of Field Archaeology*, I included all articles ($n = 142$) from 1989 to 1998, not including “technical reports” or “special studies.” From *Ancient Mesoamerica* I included 165 of the 181 articles (not including editorials and the brief introductions to special sections) published from 1990 to 1998. The sixteen articles omitted from the study did not focus directly on ancient Mesoamerica: memorials to deceased archaeologists, reminiscences on the impact of the Carnegie Institution, discussions of psychoactive toads, etc. From *Southeastern Archaeology* I included 79 of the 88 papers published between 1989 and 1998. Seven papers in the 1994 special issue were not considered because the bibliographies for each paper were mixed together with those of the other papers. An additional two papers were omitted from the discussion because they were historical/biographical (a paper on Jeffries Wyman in the first issue of 1990 and a paper on the Alabama Anthropological Society in the second issue of 1994).

The 285 papers included in the multiple regression represent approximately two thirds of the total articles that appeared in the four journals during the time spans monitored. The other third of the papers were excluded because I could not readily determine the professional age of the first author or because the papers could not be assigned to any of the ten research topics.

The analysis of comments published in *American Antiquity* was based on a sample of 37 comments from the years 1989–1998. A total of 51 comments were published in this time period; 14 were excluded from the analysis because they contained no bibliography.

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