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Self-Archiving Journal Articles: A Case Study of Faculty Practice and Missed Opportunity

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abstract: Carnegie Mellon faculty Web pages and publisher policies were examined to understand self-archiving practice. The breadth of adoption and depth of commitment are not directly correlated within the disciplines. Determining when self-archiving has become a habit is difficult. The opportunity to self-archive far exceeds the practice, and much of what is self-archived is not aligned with publisher policy. Policy appears to influence neither the decision to self-archive nor the article version that is self-archived. Because of the potential legal ramifications, faculty must be convinced that copyright law and publisher policy are important and persuaded to act on that conviction.

Introduction and Background

For centuries, law, technology, and cost have constrained the dissemination of scholarly work. Over the past two decades, much has changed in the landscape. Information technologies have changed the method and economics of dissemination as well as the expectations of authors and readers. Shrinking readerships resulting from the rising cost of scholarly journals[1] and the proven impact advantage of providing free online access to scholarly work[2] have converged in a worldwide open access movement. The aim is equitable access to quality information, viewed as necessary to achieve the private career goals of researchers and the shared community goals of accelerating innovation and solving social problems. Though information technologies have profoundly changed human behavior and expectation, the legal framework that girds access to information has not significantly changed.

Within this context, institutions of higher education are engaged in efforts to help faculty manage their copyrights and provide open access to their work. Libraries provide much of this assistance. Libraries offer educational programs to raise faculty awareness of the importance of open access in disseminating and increasing the impact of their work and the importance of negotiating copyright transfer agreements.[3] Libraries also provide tools and support, including model addenda for publishing agreements and institutional repositories (IR).[4] Faculty can attach an addendum to their copyright transfer agreements to retain—or at least begin discussion with the publisher about retaining— the rights necessary for them to provide open access to their work. With the necessary rights, they can legally deposit their work on a departmental server or, preferably, in an IR where the library will disseminate, showcase, and preserve it.

Libraries are implementing or licensing repositories, identifying and recruiting content for them, and leading or participating in initiatives to develop campus IR policies.[5] The goal is habitual direct deposit (self-archiving) by faculty or their assistants, though library staff may deposit work on behalf of the faculty.[6] Although IRs have not had the dramatic impact on scholarly communication that was initially envisioned,[7] and questions have been raised about the ongoing short-sightedness of IR planning and management,[8] the movement to provide open access repositories of scholarly work accessible through Internet search engines has not lost momentum. In many ways, the success of these repositories hinges on the success of efforts to convince faculty that open access is important and to persuade them to act on that conviction by doing what it takes to retain the necessary rights and to comply with publisher open access policies.

Prior to providing faculty with tools and instruction to facilitate self-archiving, Carnegie Mellon University Libraries wanted to know what full-text material was already freely accessible from faculty Web pages. In 2007–08, the libraries conducted two studies to improve our understanding of faculty self-archiving practice and the opportunity to self-archive in different disciplines. For our purposes, "self-archiving" meant that the faculty member or his or her designate had provided a link to an open access copy of the work. The goals of our studies were to ascertain trends and to gather baseline data that would inform strategic plans to facilitate self-archiving in compliance with policy and law and enable assessing changes in practice over time. Months after the studies started, the provost funded an institutional repository. Findings from the studies will help the libraries identify content and willing contributors to the repository.

The two studies were conducted in parallel from May 2007 through April 2008. The first study examined faculty Web pages to gain an understanding of the types of publications produced across the disciplines, for example, journal articles, conference papers, and book chapters, and the types of access (if any) provided to the full text of the work, for example, open access, restricted access (available by subscription), and access on request. Findings from the first study are available on this author's Web site.[9] This article reports key findings from the second study, which examined more closely the journal publications identified in the first study in order to enhance our understanding of faculty behavior, to assess the opportunity to self-archive articles in different disciplines based on publisher policy, and to determine whether faculty practice is aligned with publisher policy. Neither study addressed why faculty do or do not choose to provide open access to their work, what rights faculty had or thought they had when they self-archived their work, or where the open access copies reside.

In many disciplines, journal articles are the primary vehicle for disseminating scholarly work. Resources are available to facilitate discovery of many journal publisher policies regarding self-archiving. A close look at publisher policies and faculty publishing and self-archiving practices can reveal the opportunity to self-archive, the gap between opportunity and practice, and the ways in which practice is or is not aligned with policy. Though faculty compliance with copyright agreements might vary across publication types, their self-archiving of journal articles can provide insights about their behavior and values that can help us target educational initiatives, select tools, set milestone goals, frame research questions, and design outcomes assessments.

Our expectations for the studies of faculty self-archiving practice were based on interviews of a stratified random sample of 87 Carnegie Mellon faculty conducted in 2006[10] and data on the accelerating annual pace of adopting self-archiving practice provided by Alma Swam and Sheridan Brown in "Open Access Self-Archiving: An Author Study."[11] We expected roughly 35 percent of the faculty to be self-archiving their work, with most of the self-archiving occurring in the School of Computer Science and College of Engineering and little self-archiving in the College of Humanities and Social Sciences and College of Fine Arts. We expected many

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faculty to treat copyright issues and publisher policies blithely. Though uncertain about the volume of articles that would be self-archived, we predicted that as more faculty in a department adopted the practice, a greater number of articles would be self-archived. In short, we expected to find a correlation between the breadth of adoption and the depth of commitment to the practice.

The study results met our expectations in some ways, but not in others. The overall breadth of adoption of self-archiving within the university is as expected, but distribution across the disciplines is not. The relationship between breadth of adoption and depth of commitment is complicated, with some very committed faculty residing in departments with little overall interest in self-archiving. As expected, the opportunity to self-archive far exceeds the practice. Publisher policy appears to influence neither the decision to self-archive nor the article version that is self-archived. Disciplinary norms are influential but not necessarily the driving factor. Though critical to outcomes assessments of scholarly communication initiatives, defining when self-archiving has become a habitual practice and when the practice complies or is sufficiently aligned with publisher policy to assuage legal concerns are difficult tasks.

How we study self-archiving practice informs our perception of the phenomenon. This study approached self-archiving from several different angles to arrive at an understanding of faculty behavior suitable for informing strategic plans and tracking changes over time. Following a discussion of the research method and data collection, the presentation of findings from the study begins with an analysis of the means by which faculty in different disciplines provide access to the full text of their journal articles. This is followed by an analysis of the breadth of adoption and depth of commitment to self-archiving across the disciplines and a look at individual faculty behavior that can skew perceptions of departmental commitment and raises questions about when self-

archiving has become habitual practice. The opportunity to self-archive in the various disciplines is then explored, based on journal publisher policies; and the gap between opportunity and practice is measured. Finally, the alignment of faculty practice with publisher policy is examined. The article concludes with a discussion of key issues and next steps.

Method, Sample, and Data Collection

The initial study identified 14,881 journal articles cited or referenced on faculty Web pages. This was the sample used in the subsequent study reported here. The articles were discovered on faculty publication lists accessible from departmental home pages. This method of discovery did not capture all of the faculty's work or all of their work that is available open access, but it did yield a detailed picture and suggest trends in faculty practice. Furthermore, by starting with faculty Web pages, the libraries could discover much of the material self-archived by our faculty, avoid the biases encountered in studies that start by selecting a sample of journals, and sidestep the inaccuracies associated with self-reporting.

In the initial study, three librarians—Kristin Heath, Diane Covington, and the author—and graduate student Maureen Williams coded the types of publications and types of access (if any) provided to the full text. Redundant citations were eliminated when faculty had multiple publications lists. Care was taken not to eliminate the occurrence with a link to the full text. No publications were eliminated based on date of publication. One publication type and one access type were assigned to each publication. If links were provided to an open access copy and a restricted access copy (available by subscription), the open access copy was counted. Only one person coded the data for each department. We decided that having multiple people code each publication would increase the time and expense of the project with little if any gain for our purposes. In retrospect, double-coding a sample set of publications might have enabled us to develop more detailed coding guidelines, resulting in fewer errors.

The data were assigned to each faculty member's home department, identified by consulting the human resources faculty/staff directory. To the best of our ability, the study focused on full-time and emeritus faculty on the tenure, research, and teaching tracks. Those we could identify as visiting, adjunct, or part-time faculty were not included in the study.

Using the data on journal articles captured in the initial study, the author created a list of all the journal titles in which the faculty had published, how many times they had published in each journal, and the type of access, if any, provided to the full text of each article. If the access type were open access, the article was viewed and coded whether the self-archived article was the published version (the publisher's PDF) or some version of the author's manuscript. No attempt was made to distinguish preprint from postprint versions of author manuscripts because in most cases it was impossible. Kristin Antelman notes in "Self-Archiving Practice and the Influence of Publisher Policies in the Social Sciences" that it is difficult, if not impossible, to distinguish author preprints from postprints.[12] If links were provided to open access copies of both the author's manuscript and the publisher's PDF, the publisher version was coded follow-

ing Antelman's principle of coding the "highest" version, the version "closest to the final publisher version."[13]

The publisher for each journal title and the publisher's policy regarding open access were identified if possible. Sources consulted were OCLC's WorldCat, the SHERPA/RoMEO database, the OakList database, and Peter Suber's open access newsletter.[14] When a policy was not found using these resources, the liaison librarians consulted publisher Web sites and, in many cases, contacted publishers to try to learn their open access policies. Faculty publications and publisher open access policies were coded from May 2007 through April 2008. Publication lists and publisher policies could be different now; therefore, the study results reported here should be viewed as a snapshot in time.

Providing Access to Full-Text Journal Articles

Of the 1,018 faculty included in the study, 771 (76 percent) had one or more publication lists accessible from their departmental home page.[15] Roughly 39 percent (14,881) of the total publications listed on faculty Web pages were journal articles. If faculty chose to provide access to the full text of their articles, providing open access was clearly the preferred method. Overall, links to open access copies were provided for 32 percent of the journal articles listed on faculty Web pages. Links to restricted access (subscription) copies were provided for 3 percent of the articles. E-mail request links were provided for 1 percent of the articles, and 1 percent of the articles had broken links.

The percentage of journal articles available via open access would probably be higher if the sample had been restricted by publication date. Faculty CVs include articles published as long ago as 1955. Though a few faculty members did scan and provide open access to their older work, most faculty who self-archive provide open access only to relatively recent work. This seems natural given busy faculty schedules, evolving research trajectories, reward systems that focus on the past three to five years, and the probable lack of available electronic copies of older work.

Disciplinary differences in faculty practice are apparent when the data are viewed per college and department. At the college level, only in the School of Computer Science is providing open access to journal articles more popular than providing no access to the full text. At the departmental level, however, this is the case in two departments in the College of Engineering (Information Networking Institute and materials science and engineering), and—to our surprise—two departments in the College of Humanities and

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Social Sciences (philosophy and psychology). Providing open access to journal articles is almost as popular as providing no access to the full text in two departments in the Mellon College of Science (biology and mathematics) (see table 1).

Though providing restricted (subscription) access to full-text journal articles is not nearly as popular as providing open access, the number of articles available via restricted access in disciplines presumed to champion open access is somewhat surprising. In physics, for example, 98 articles (9 percent of the total articles) are available via restricted

Table 1.

Articles by department and access type.

	Total articles	Open access	Restricted access	On request	Broken link	No link
College of Engineering	**4,713**	**24%**	**2%**	**0%**	**1%**	**73%**
Biomedical Eng	101	36%	6%			64%
Chemical Eng	873	10%	6%			84%
Civil & Environmental Eng	517	3%	1%			96%
Electrical & Computer Eng	1,350	23%	1%		1%	75%
Engineering & Public Policy	247	15%	2%	9%	2%	72%
Information Networking Inst	10	40%	40%			20%
Inst for Complex Eng Sys	17					100%
Materials Science & Eng	1,092	50%	1%		1%	48%
Mechanical Eng	506	19%	2%			79%
College of Fine Arts	**200**	**17%**	**0%**	**0%**	**1%**	**83%**
Architecture	147	21%			1%	78%
Art	18	6%				94%
Design	3	33%				67%
Drama	21					100%
Music	11					100%
College of Humanities and Social Sciences	**2,419**	**40%**	**1%**	**0%**	**1%**	**58%**
English	61	11%	3%			85%
History	99		8%		1%	91%

Modern Languages	64	6%			2%	92%
Philosophy	221	61%	1%		2%	36%
Psychology	1,141	62%			2%	37%
Social & Decision Sciences	329	5%			1%	95%
Statistics	504	21%	1%		1%	76%
Heinz School of Public Policy and Management	**380**	**26%**	**0%**	**0%**	**2%**	**72%**
Mellon College of Science	**3,414**	**41%**	**7%**	**3%**	**0%**	**58%**
Biology	352	41%	15%		1%	42%
Chemistry	1,361	17%	5%			77%
Mathematics	617	47%	2%		1%	49%
Physics	1,084	36%	9%	9%		45%
School of Computer Science	**2,340**	**55%**	**5%**	**2%**	**3%**	**35%**
Computer Science	833	58%	8%		3%	31%
Entertainment Tech Center	4					100%
Human Comp Interact Inst	295	38%	4%		4%	54%
Inst Software Research Int	265	48%	7%	20%	3%	22%
Language Tech Inst	120	55%	2%		5%	38%
Machine Learning	139	52%	9%		2%	37%
Robotics Institute	684	62%			2%	36%
Tepper School of Business	**1,415**	**16%**	**3%**	**2%**	**2%**	**77%**
CARNEGIE MELLON	**14,881**	**32%**	**3%**	**1%**	**1%**	**63%**

access; and in the Computer Science Department, 67 articles (8 percent of the total) are available restricted access. In the School of Computer Science, 117 articles (5 percent of the total) are available via restricted access from faculty Web pages. More detailed probing of the data in physics and computer science revealed that some faculty *only* provided restricted access to their articles but that most of the faculty who provided restricted access to articles also provided open access to other articles. This could also be the case in other departments in which faculty provided restricted access to articles.

What led some faculty to provide only restricted access and other faculty to provide both open and restricted access to their articles is unknown. The publication dates and notations on faculty Web pages suggest that many faculty update their publication lists infrequently. Given that time is a scarce resource for faculty, if they do not understand copyright or the difference between open access and the access provided by licensed library resources, they could simply link to whatever version is handy at the time they update their publication lists.

The Breadth and Depth of Self-Archiving Journal Articles

Self-archiving practice can be assessed based on either the percentage of faculty who self-archive (an indication of the breadth of adoption) or the percentage of articles self-archived (an indication of the depth of commitment to the practice). Though no firm conclusions can be drawn, the number of articles self-archived per faculty member can fuel speculation about whether the practice of self-archiving is deeply entrenched.

Over one-third (34 percent) of the faculty in the university have self-archived at least one journal article. Of the faculty with publication lists accessible from their departmental home pages, 45 percent have self-archived at least one article. This met or exceeded our expectations. As predicted, faculty in the School of Computer Science exhibit both the greatest breadth of adoption and the greatest depth of commitment to self-archiving. Sixty-seven percent of the faculty self-archive journal articles, and 55 percent of the journal articles listed on faculty Web pages are linked to open access copies. Faculty in the College of Engineering, however, did not meet our expectations. Only 30 percent of the engineering faculty have self-archived one or more journal articles, and only 24 percent of the articles listed on faculty Web pages are linked to open access copies.

Table 2 provides the percentage of faculty in each college and department who have self-archived one or more journal articles and, of these, the percentage who have self-archived various volumes of articles. A comparison of the breadth of adoption (percentage of faculty who self-archive articles) shown in table 2 to the depth of adoption (the percentage of articles available through open access) shown in table 1 reveals that the two measures are not always in step. For example, in the Tepper School of Business, 46 percent of the faculty have self-archived at least one journal article, but only 16 percent of the articles listed on faculty Web pages have been self-archived. This suggests somewhat broad adoption of the practice but shallow commitment to it. Many factors could contribute to this phenomenon, including the unlimited range of article publication dates in the study. Of the 73 Tepper faculty with publication lists accessible from the school home page, 20 (27 percent) have lists with journal articles published prior to 1990. Several faculty have lists with articles published as long ago as the 1950s,

1960s, or 1970s. The low probability that these older publications will be self-archived helps to explain the apparent lack of commitment to self-archiving practice despite the considerable breadth of adoption by Tepper School faculty.

Like faculty in the Tepper School of Business, faculty in the College of Engineering and the School of Computer Science appear to have greater breadth of adoption than depth of commitment. Faculty in the other colleges appear to have greater depth of commitment than breadth of adoption. The number of articles self-archived by individual faculty can illuminate the relationship between perceived breadth and depth of self-archiving practice.

Throughout the university, over two-thirds (67 percent) of the faculty who have self-archived journal articles have archived no more than 10 articles. Only 11 percent of the faculty who have self-archived journal articles has self-archived more than 30 articles. In contrast, six faculty have self-archived more than 100 articles, and 13 faculty have self-archived 51 to 100 articles. These 19 faculty members, roughly 6 percent of the faculty who have self-archived journal articles, have self-archived almost 40 percent of the total articles self-archived by campus faculty.

Self-archiving is probably not habitual practice for all faculty who have self-archived journal articles. Some of this self-archiving behavior could actually deviate from standard practice. For example, many faculty members have a single Web page created using a departmental template that imposes a consistent look and feel to the pages. Typically these pages provide a short list of "recent" or "selected" publications, one or more of which is linked to an open access copy but none of which were published within the past few years—suggesting that the pages are not maintained.

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Under these circumstances, self-archiving is probably not routine. Links to open access copies must be interpreted cautiously without assuming that the faculty provided the links themselves or that they are even aware of the open access movement or impact advantage.

If we assume that faculty who have self-archived more than 30 journal articles habitually provide open access to their articles, then 11 percent of Carnegie Mellon faculty have developed the habit. If we lower the bar to self-archiving more than 10 articles, then one-third of the faculty have developed the habit. Granted, faculty demographics (for example, their age, faculty track, and rank on the track[16]), the pace at which their work yields publications, and the importance of journal articles in disseminating work in their field constrain the number of articles available for self-archiving. Nevertheless, two points are clear. First, there is reason to question whether self-archiving is standard practice for a considerable number of faculty who have self-archived fewer than 10 journal articles. Second, many departments have at least one faculty member who enthusiastically, if not habitually, self-archives, having self-archived over 30 journal articles.

Because the Tepper School of Business and Heinz School of Public Policy and Management do not have departments, they are treated as departments throughout this article in discussions of departmental behavior. Eight departments appear to have

Table 2.

Faculty self-archiving of journal articles

	Faculty		% Self-archiving faculty who self-archived volume of articles						
	Total	Self-archive	1-10	11-30	31-50	51-100	101-150	151-200	>200
College of Engineering	**179**	**30%**	**59%**	**26%**	**8%**	**4%**		**2%**	**2%**
Biomedical Eng	8	25%	50%		50%				
Chemical Eng	23	17%	25%	50%	25%				
Civil & Environmental Eng	20	10%	50%	50%					
Electrical & Computer Eng	60	43%	62%	31%	4%	4%			
Engineering & Public Policy	16	31%	80%	20%					
Information Networking Inst	3	100%	100%						
Inst for Complex Eng Sys	10	0%							
Materials Science & Eng	16	31%	40%			20%		20%	20%
Mechanical Eng	23	26%	50%	33%	17%				
College of Fine Arts	**184**	**3%**	**80%**	**20%**					
Architecture	19	16%	67%	33%					
Art	21	5%	100%						
Design	15	7%	100%						
Drama	37	0%							
Music	92	0%							

	n								
College of Humanities and Social Sciences	**148**	**34%**	**60%**	**18%**	**12%**	**6%**	**4%**		
English	29	7%							
History	21	0%	100%						
Modern Languages	21	5%	100%						
Philosophy	16	88%	71%	21%		7%			
Psychology	26	65%	29%	12%	35%	12%	12%		
Social & Decision Sciences	14	21%	67%	33%					
Statistics	21	62%	77%	23%					
Heinz School of Public Policy and Management	**54**	**17%**	**67%**	**22%**	**11%**				
Mellon College of Science	**158**	**31%**	**61%**	**14%**	**6%**	**14%**	**4%**		
Biology	33	73%	88%	8%	4%				
Chemistry	39	15%	33%	17%		50%			
Mathematics	40	28%	46%	36%		9%	9%		
Physics	46	17%	25%		25%	38%	13%		
School of Computer Science	**205**	**67%**	**67%**	**29%**	**3%**	**1%**			
Computer Science	63	67%	55%	38%	7%				
Entertainment Tech Center	11	0%							
Human Comp Interact Inst	22	68%	80%	20%					
Inst Software Research Int	28	39%	46%	55%					
Language Techn Inst	21	76%	94%	6%					
Machine Learning	7	100%	57%	43%					
Robotics Institute	53	89%	72%	23%	2%	2%			
Tepper School of Business	**90**	**46%**	**88%**	**10%**	**2%**	**4%**	**1%**	**0%**	**0%**
CARNEGIE MELLON	**1,018**	**34%**	**67%**	**22%**	**6%**	**4%**	**1%**	**0%**	**0%**

both significant breadth of adoption and depth of commitment: biology, computer science, Language Technologies Institute, machine learning, Robotics Institute, philosophy, psychology, and the Information Networking Institute. The Human Computer Interaction Institute, Statistics Department, and Tepper School of Business seem to have good breadth of adoption but to lack strong commitment. In contrast, the following departments seem to have strong commitment from a relatively small group of adopters: chemistry, mathematics, physics, electrical and computer engineering, materials science and engineering, and the Institute for Software Research International. The Heinz School of Public Policy and Management and the biomedical engineering, chemical engineering, and mechanical engineering departments appear to have neither great breadth of adoption nor serious depth of commitment but to have at least one enthusiastic faculty member who has self-archived more than 30 journal articles.

Opportunity to Self-Archive Journal Articles

Barring any privately negotiated agreements, the publisher's open access policy determines whether or not faculty have the opportunity to self-archive an article and, if so, the parameters of that opportunity. This study assessed opportunity on the basis of the publisher's general policy regarding self-archiving on personal or departmental Web sites because, when the study began, we had no plans for an institutional repository.

Publisher policies were found for roughly 90 percent (13,325) of the total journal articles cited on faculty Web pages and 92 percent (4,472) of the articles self-archived by the faculty. Publisher policies for articles in the humanities and fine arts were the most difficult to find. Table 3 provides an analysis of the opportunity to self-archive journal articles published by Carnegie Mellon faculty and an analysis of the articles the faculty have self-archived based on publisher policies. The gap between opportunity and practice is also shown in table 3.

Throughout the university, 77 percent of the total articles cited on faculty Web pages could be self-archived in compliance with publisher policy. Self-archiving is prohibited for 12 percent of the articles. No policy was found for 10 percent of the articles. The view is different within the colleges and departments. For example, almost 90 percent of the articles in the School of Computer Science and over 80 percent of the articles in the College of Humanities and Social Sciences could be self-archived. Little more than half of the articles in the College of Fine Arts could be self-archived.

Self-archiving is prohibited most frequently in chemistry; policies for 52 percent of the total articles prohibit self-archiving. Policies for many articles in chemical engineering, mechanical engineering, and biomedical engineering also prohibit self-archiving. Despite these restrictions, there is ample opportunity to self-archive articles in these disciplines. Overall, Carnegie Mellon faculty have a tremendous opportunity to provide open access to their work.

Gap Between Opportunity and Practice

Faculty self-archived journal articles published by publishers that allow self-archiving, publishers that prohibit self-archiving, and publishers for which no policy

Table 3.
Analysis of self-archiving opportunity and practice

	Total	Articles & policies		Total OA	OA articles & policies		GAP
		OA Yes	OA No		OA Yes	OA No	
College of Engineering	**4,713**	**75%**	**14%**	**1,134**	**84%**	**9%**	**2,601**	**73%**
Biomedical Eng	101	70%	23%	36	100%	0%	35	49%
Chemical Eng	873	67%	30%	90	57%	42%	532	91%
Civil & Environmental Eng	517	74%	18%	18	17%	78%	377	99%
Electrical & Computer Eng	1,350	90%	0%	309	86%	0%	949	78%
Engineering & Public Policy	247	79%	6%	36	75%	3%	167	86%
Information Networking Inst	10	90%	0%	4	100%	0%	5	56%
Inst for Complex Eng Sys	17	65%	18%	0			11	100%
Materials Science & Eng	1,092	71%	9%	544	91%	4%	283	36%
Mechanical Eng	506	61%	32%	97	67%	24%	242	79%
College of Fine Arts	**200**	**56%**	**2%**	**33**	**85%**	**0%**	**84**	**75%**
Architecture	147	64%	0%	31	84%	0%	68	72%
Art	18	56%	0%	1	100%	0%	9	90%
Design	3	100%	0%	1	100%	0%	2	67%
Drama	21	24%	10%	0			5	100%
Music	11	0%	9%	0			0	100%

Table 3, continued.

	Articles & policies			OA articles & policies			GAP
	Total	OA Yes	OA No	Total OA	OA Yes	OA No	
College of Humanities and Social Sciences	**2,419**	**81%**	**5%**	**970**	**86%**	**6%**	**57%**
English	61	48%	3%	7	86%	0%	79%
History	99	58%	5%	0			100%
Modern Languages	64	33%	16%	4	25%	0%	95%
Philosophy	221	76%	6%	135	75%	7%	40%
Psychology	1,141	88%	5%	703	90%	5%	37%
Social & Decision Sciences	329	79%	6%	15	87%	7%	95%
Statistics	504	82%	4%	106	79%	7%	80%
Heinz School of Public Policy and Management	**380**	**71%**	**6%**	**99**	**71%**	**10%**	**74%**
Mellon College of Science	**3,414**	**72%**	**24%**	**1,065**	**82%**	**13%**	**64%**
Biology	352	83%	8%	145	79%	8%	61%
Chemistry	1,361	47%	52%	233	53%	47%	81%
Mathematics	617	88%	6%	292	86%	6%	54%
Physics	1,084	91%	6%	395	98%	1%	61%
School of Computer Science	**2,340**	**87%**	**2%**	**1,286**	**90%**	**2%**	**43%**
Computer Science	833	93%	1%	485	96%	1%	40%
Entertainment Tech Center	4	0%	0%	0			

Human Comp Interact Inst	295	89%	1%	112	87%	0%	167	63%
Inst Software Research Int	265	76%	2%	126	78%	1%	104	51%
Language Tech Inst	120	84%	1%	66	83%	2%	46	46%
Machine Learning	139	92%	4%	72	90%	6%	63	49%
Robotics Institute	684	83%	4%	425	90%	3%	184	33%
Tepper School of Business	**1,415**	**79%**	**2%**	**229**	**86%**	**1%**	**919**	**82%**
CARNEGIE MELLON	**14,881**	**77%**	**12%**	**4,816**	**85%**	**7%**	**7,374**	**64%**

was found. The gap between opportunity and practice at Carnegie Mellon shown in table 3 was calculated by subtracting the number of faculty self-archived articles published in journals that allow self-archiving from the total number of articles faculty published in journals that allow self-archiving. More than half (53 percent) of the departments in the university have a gap of 70 percent or more. Over one-third (38 percent) of the departments have a gap of 80 percent or more. No department has closed the gap between opportunity and practice. Perfection is unlikely because of the many factors that influence faculty behavior. Given the unlimited date range of the journal publications in this study, a gap of 30 percent might be an optimistic goal. If so, then the following departments are poised to achieve their full self-archiving potential: the Robotics Institute (33 percent gap), materials science and engineering (36 percent), psychology (37 percent), philosophy, and computer science (40 percent each). With the exception of materials science and engineering, these departments exhibit both substantial breadth of adoption and depth of commitment to self-archiving. Materials science and engineering has depth without breadth, based on the behavior of a couple extremely enthusiastic self-archivers.

> **Faculty self-archived journal articles published by publishers that allow self-archiving, publishers that prohibit self-archiving, and publishers for which no policy was found.**

According to the calculated gap, 7,374 journal articles cited on faculty Web pages that have not been self-archived could be self-archived in compliance with publisher policy regarding self-archiving on personal and departmental Web pages. These articles and the roughly 4,000 articles the faculty have already self-archived from journals that allow self-archiving are potential content for our new institutional repository. The determining factors are whether the publishers allow self-archiving in institutional repositories and, if so, whether the article version allowed by publisher policy is available.

Journal Article Versions Self-Archived

The study did not distinguish preprints from postprints because faculty often provided no definitive information about the manuscript version. Instead, the study recorded whether the publisher's PDF or some version of the author's manuscript was self-archived. Overall, 41 percent of the articles self-archived throughout the university were author manuscripts, and 59 percent were publisher PDFs. The distribution within the departments is somewhat different.

Both publisher and author versions were self-archived in every department except art and design, in which only one faculty member has self-archived journal articles. In biology, psychology, social and decision sciences, and most departments in the College of Engineering and the Heinz School of Public Policy and Management, most articles self-archived are publisher PDFs. In other disciplines, self-archived author manuscripts exceed self-archived publisher PDFs. This typically occurs in disciplines with a culture of sharing work earlier in its life cycle— in mathematics, physics, the Computer Science Department, and the Language Technologies Institute. It also occurs in engineering and public policy and the Tepper School of Business. The data suggest a possible preference within the discipline but raise questions about individual faculty behavior.

Throughout the university, 25 percent of faculty who have self-archived at least one journal article have self-archived only author manuscripts; 20 percent have self-archived only publisher PDFs. Over half (55 percent) of the faculty who have self-archived journal articles have self-archived both author and publisher versions. The view at the departmental level presents some striking contrasts to this overall picture. For example, 79 percent of the biology faculty who self-archive journal articles have self-archived only publisher PDFs. Slightly more than half (54 percent) of the faculty in Tepper School of Business who self-archive articles have self-archived only author manuscripts. In engineering, public policy, and philosophy, roughly 40 percent of the faculty who self-archive articles have self-archived only author manuscripts, and 40 percent have self-archived both author and publisher versions. Faculty in the Heinz School of Public Policy and Management exhibit a somewhat stronger tendency to self-archive both versions than to self-archive only author manuscripts (44 percent versus 33 percent).

In departments with an apparent preference for self-archiving either the author or publisher version, based on the number of articles self-archived per version, many, if not most, faculty have self-archived both publisher PDFs and author manuscripts. If there is a disciplinary preference for self-archiving a particular version, faculty in many departments appear to be either unaware of or unconcerned about it, perhaps too busy to be bothered with such details. However, many publisher policies that allow self-archiving are very concerned about the version self-archived.

Alignment with Publisher Policy

For educational initiatives to be deemed successful, faculty practice must at least be aligned—if not fully compliant—with publisher policy. Full compliance is impossible to determine. In most cases, author manuscripts prior to peer review (preprints) cannot be distinguished from author manuscripts after peer review (postprints) because faculty do not label the version. Often compliance with embargo periods cannot be determined because the date of self-archiving is unknown. Given these difficulties, the work required to assess compliance with publisher policy details like the specific text to be displayed before and after publication, removal of preprints after publication, and links to publisher Web sites was determined to be too labor intensive to pursue in this study. The study focused instead on the determination of alignment with policy.

Alignment was assessed based on two factors: the publisher's general policy regarding self-archiving on personal or departmental Web sites and, if self-archiving is allowed, stipulations about self-archiving the publisher's PDF. The study assumed that the faculty self-archiving their articles met all other conditions or restrictions required by the publisher, including payment of any necessary fees and compliance with embargo periods.

Publisher policies were found for 90 percent (13,325) of the total journal articles cited on Carnegie Mellon faculty Web pages. Of these, policies for 14 percent (1,843) of the articles prohibit self-archiving. Policies for almost 6 percent (758) of the articles allow only self-archiving of postprints. Policies for less than 1 percent (21) of the articles allow only self-archiving of preprints. Policies for the remaining 80 percent (10,703) of the articles allow self-archiving of both preprints and postprints.

According to the SHERPA/RoMEO color codes, publishers that prohibit self-archiving are white, those that allow self-archiving of only postprints are blue, those that allow self-archiving of only preprints are yellow, and those that allow self-archiving of both preprints and postprints are green. Often publishers that allow self-archiving set conditions or restrictions that must be followed to comply with the policy. In assigning the color codes, SHERPA/RoMEO assigns code yellow to publishers that allow self-archiving of both preprints and postprints if the publisher requires an embargo period before the postprint can be self-archived.[17] The study reported here did not track embargo periods and, therefore, treats publishers that allow self-archiving of preprints and postprints as green publishers.

Obviously the self-archiving of author manuscripts or publisher PDFs is not aligned with the policies of white publishers, who prohibit self-archiving. Self-archiving publisher PDFs is also not aligned with the policies of yellow publishers, who prohibit self-archiving postprints. Determining whether faculty self-archiving practice is aligned with the policies of blue and green publishers requires additional information about the publishers' policies. This study focused strictly on whether blue and green publisher policies allow, require, or prohibit the self-archiving of publisher PDFs. If some version of the author's manuscript were self-archived, the study assumed faculty practice was aligned with publisher policy. In the case of blue publishers, who prohibit self-archiving of preprints, this assumption could yield an assessment of alignment that is higher than it should be. In the case of green publishers who allow self-archiving of preprints prior to publication but after publication require removal of the preprint and posting of the publisher PDF, the study assumed alignment with publisher policy only if the publisher PDF were self-archived. The assumption was based on the belief that busy faculty are unlikely to self-archive the same article twice and evidence that faculty Web pages are not well maintained—for example, citations marked "forthcoming" with publication dates long passed. However, this assumption could yield an assessment of alignment that is lower than it should be if articles marked as "forthcoming" had not yet been published and if the author manuscript were archived.

Throughout the university, 50 percent of the total articles available via open access are aligned with publisher policy, and 38 percent are not aligned with policy in terms of whether self-archiving on personal and departmental Web sites is allowed and whether publisher policy allows, prohibits, or requires self-archiving the publisher PDF. For 5 percent of the articles, publisher policy allows open access, but the policy is unclear about the version that may be self-archived. No publisher policy was found for the remaining 8 percent of self-archived articles. Of the self-archived articles not aligned with publisher policy, 18 percent breach white publisher policies, which prohibit all self-archiving; and 82 percent are not aligned with yellow, green, or blue publisher policies in terms of the version that was self-archived. The greatest problem, by far, is the self-archiving of the publisher PDF when it is prohibited by publisher policy.

Again, disciplinary differences surface at the college and departmental level (see table 4). Roughly two-thirds of the articles self-archived by faculty in the Tepper School of Business and Mellon College of Science are aligned with publisher policy. More than half of the articles self-archived in the College of Engineering and School of Computer Science are aligned with publisher policy. In contrast, close to two-thirds of the articles

self-archived in the College of Humanities and Social Sciences, over half of the articles self-archived in the College of Fine Arts, and almost half of the articles self-archived in the Heinz School of Public Policy and Management are not aligned with publisher policy. Some self-archiving activity in almost every department is not aligned with publisher policy. The most egregious lack of alignment with publisher policy is in civil and environmental engineering, followed by chemical engineering, and, to a lesser extent, mechanical engineering, psychology, and social and decision sciences.

Table 4 also provides an analysis of how self-archiving practice is not aligned with publisher policies. In most departments, the most frequent problem is self-archiving the publisher PDF when publisher policy prohibits it. However, self-archiving the author manuscript when publisher policy requires self-archiving the publisher PDF is the most frequent problem in electrical and computer engineering and a frequent problem in engineering and public policy, biomedical engineering, and departments in the School of Computer Science. There is an obvious tension between the disciplinary practice of sharing work early in its life cycle and the requirement to self-archive the publisher's PDF. Self-archiving when publisher policy prohibits it is the most frequent problem in chemistry, chemical engineering, and civil and environmental engineering (disciplines with the largest percentage of articles published in journals that prohibit self archiving; see table 3). It is also a significant issue in mathematics, philosophy, statistics, mechanical engineering, the Heinz School of Public Policy and Management, and, to a lesser extent, a concern in many other departments.

> **There is an obvious tension between the disciplinary practice of sharing work early in its life cycle and the requirement to self-archive the publisher's PDF.**

Influence of Publisher Policy

Antelman's study of selected social sciences journals found a higher overall self-archiving rate for white journals, which prohibit self-archiving, than for green journals, which allow self-archiving of both preprints and postprints, and a disciplinary pattern of self-archiving author or publisher versions regardless of publisher policy. She concluded that author behavior is not influenced by publisher policies, but rather by disciplinary norms.[18]

The Carnegie Mellon study reported here covered all disciplines pursued at Carnegie Mellon and all of the journals in which the faculty published (according to publication lists available on faculty Web pages accessible from departmental home pages). Overall, the self-archiving rate for green journals was higher than for white journals (37 percent versus 20 percent; see table 5). However, in almost all of the departments in which faculty have published in white journals, faculty have self-archived articles from white journals. In some departments, the self-archiving rate for white journals is higher than for green journals, for example psychology (73 percent versus 62 percent), philosophy (71 percent versus 61 percent), statistics (32 percent versus 23 percent), machine learning (80 percent versus 51 percent), and the Heinz School of Public Policy and Management (45 percent versus 26 percent).

Table 4.

Alignment of self-archived articles with publisher policies.

College / School	Total articles	Self-archived articles and policies				Reasons not aligned		
		No policy	Policy unclear	Aligned	Not aligned	No OA	Require pub PDF	Prohibit pub PDF
College of Engineering	**1,134**	**7%**	**1%**	**56%**	**35%**	**25%**	**14%**	**61%**
Biomedical Eng	36			81%	19%		43%	57%
Chemical Eng	90	1%	1%	20%	78%	54%		46%
Civil & Environ Eng	18	6%		6%	89%	88%		13%
Electrical & Comp Eng	309	13%	2%	60%	25%		51%	49%
Eng & Public Policy	36	22%		58%	19%	14%	71%	14%
Info Networking Inst	4			75%	25%			100%
Inst Complex Eng Sys	0							
Materials Sci & Eng	544	4%		69%	27%	15%	1%	84%
Mechanical Eng	97	9%	8%	9%	73%	32%	10%	58%
College of Fine Arts	**33**	**15%**	**3%**	**24%**	**58%**	**0%**	**0%**	**100%**
Architecture	31	16%		23%	61%			100%
Art	1			100%				
Design	1		100%					
Drama	0							
Music	0							

	n							
College of Humanities and Social Sciences	**970**	**8%**	**8%**	**21%**	**63%**	**9%**	**1%**	**90%**
English	7	14%		57%	29%			100%
History	0							
Modern Languages	4	75%		25%				
Philosophy	135	18%	4%	44%	34%	22%		78%
Psychology	703	5%	9%	14%	73%	7%		92%
Social & Decision Sci	15	7%		20%	73%	9%	9%	82%
Statistics	106	14%	11%	38%	37%	18%	3%	79%
Heinz School of Public Policy & Management	**99**	**19%**	**6%**	**29%**	**45%**	**22%**	**2%**	**76%**
Mellon College of Science	**1,065**	**5%**	**2%**	**65%**	**29%**	**47%**	**0%**	**53%**
Biology	145	14%	2%	27%	57%	13%		87%
Chemistry	233	8%	43%	57%	83%			17%
Mathematics	292	8%	7%	72%	13%	46%	3%	51%
Physics	395	1%		86%	13%	8%		92%
School of Computer Science	**1,286**	**8%**	**8%**	**53%**	**31%**	**5%**	**25%**	**70%**
Computer Science	485	4%	5%	59%	33%	3%	28%	69%
Entertainment Tech Ctr	0							
Human Comp Inter Inst	112	13%	13%	38%	36%		15%	85%
Inst Software Res Int	126	21%	2%	48%	28%	3%	34%	63%
Language Tech Inst	66	15%	5%	58%	23%	7%	43%	50%
Machine Learning	72	7%	11%	46%	36%	8%	15%	77%
Robotics Institute	425	7%	12%	52%	29%	10%	20%	70%
Tepper School of Business	**229**	**13%**	**2%**	**67%**	**18%**	**7%**	**0%**	**93%**
CARNEGIE MELLON	**4,816**	**8%**	**5%**	**50%**	**38%**	**18%**	**9%**	**73%**

Table 5.

Self-archiving rate by publisher policy type.

Policy	Total articles	% Total articles	Total OA articles	% Total OA articles	Self-archiving rate
Yellow	21	0.16%	9	0.20%	43%
Green	10,703	80%	3924	88%	37%
Blue	758	6%	179	4%	24%
White	1,843	14%	360	8%	20%
	13,325		4,472		34%

Table 6 provides details on the versions self-archived by department and publisher policy type. In the College of Engineering and the College of Humanities and Social Sciences, the distribution of self-archived author manuscripts and publisher PDFs is roughly the same for articles in green and white journals. This is also the case in many departments, including chemical engineering, mechanical engineering, psychology, mathematics, computer science, and machine learning. Overall, more than three-fourths of the self-archived articles published in white, yellow, and blue journals are publisher PDFs. Self-archived articles from green journals, in which most of the articles were published, are more equally distributed between author manuscripts (43 percent) and publisher PDFs (57 percent). Outside of the physical and computer sciences, the self-archiving of author manuscripts rarely exceeds the self-archiving of publisher PDFs, regardless of policy.

All of the 360 self-archived articles from white journals, 36 percent of the 3,924 self-archived articles from green journals, 28 percent of the 179 self-archived articles from blue journals, and 78 percent of the 9 self-archived articles from yellow journals are not aligned with publisher policy. The data suggest what Antelman concluded—publisher policy is not influencing self-archiving behavior.

Issues and Next Steps

The gap between the opportunity and practice of self-archiving journal articles is quite large in most departments. Nevertheless, Carnegie Mellon faculty prefer open access as the method to provide access to the full text of their work. Almost half (45 percent) of the faculty with publication lists linked to their departmental Web site have self-archived at least one journal article. Even in departments with few faculty who self-archive articles, there are often one or more enthusiastic self-archivers. This study identified faculty in almost every department who can help the libraries raise awareness among their col-

Table 6.
Article versions self-archived by publisher policy type.

	YELLOW Preprint only		BLUE Postprint only		GREEN Preprint and Postprint		WHITE OA Prohibited	
	Auth	Pub	Auth	Pub	Auth	Pub	Auth	Pub
College of Engineering	100%		13%	87%	19%	81%	14%	86%
Biomedical Eng					19%	81%		
Chemical Eng			25%	75%	15%	85%	8%	92%
Civil & Environ Eng				100%	50%	50%		100%
Electrical & Comp Eng	100%		100%		31%	69%		
Eng & Public Policy					81%	19%	100%	
Info Networking Inst					50%	50%		
Inst Complex Eng Sys								
Materials Sci & Eng			4%	96%	7%	93%	23%	77%
Mechanical Eng			100%		25%	75%	22%	78%
College of Fine Arts		67%	33%	17%	83%	82%		
Architecture			67%	33%	18%			
Art								
Design						100%		
Drama								
Music								

Table 6, continued.

	YELLOW Preprint only		BLUE Postprint only		GREEN Preprint and Postprint		WHITE OA Prohibited	
	Auth	Pub	Auth	Pub	Auth	Pub	Auth	Pub
College of Humanities and Social Sciences		100%	10%	90%	21%	79%	27%	73%
English					33%	67%		
History								
Modern Languages					100%			
Philosophy				100%	47%	53%	80%	20%
Psychology		100%	7%	93%	13%	87%	13%	87%
Social & Decision Sci			50%	50%	18%	82%		100%
Statistics			13%	88%	49%	51%	29%	71%
Heinz School of Public Policy and Management				100%	45%	55%		100%
Mellon College of Science			8%	92%	67%	33%	27%	73%
Biology				100%	8%	92%	55%	45%
Chemistry			25%	75%	75%	25%	18%	82%
Mathematics					86%	14%	72%	28%
Physics			25%	75%	65%	35%		100%

School of Computer Science	**14%**	**86%**	**75%**	**25%**	**53%**	**47%**	**29%**	**71%**
Computer Science		100%	80%	20%	60%	40%	50%	50%
Entertainment Tech Center	100%							
Human Comp Interact Inst			100%		46%	54%		
Inst Software Research Int			50%	50%	54%	46%	100%	100%
Language Tech Inst				100%	80%	20%		
Machine Learning				100%	45%	55%	50%	50%
Robotics Institute		100%	88%	12%	42%	58%	14%	86%
Tepper School of Business			17%	83%	82%	18%	100%	
CARNEGIE MELLON	**22%**	**78%**	**22%**	**78%**	**43%**	**57%**	**23%**	**77%**

leagues of the importance of open access for their discipline and its potential impact on their personal careers.

The study confirmed that faculty self-archiving practice is often not aligned with publisher policy and identified how this practice is not aligned with policy. The next steps are to understand why practice is not aligned with publisher policy, and what level of alignment is reasonable to expect from faculty and sufficient to assuage the concerns of university legal counsel. Whatever the reasons, the lack of alignment is cause for concern. Libraries and institutions of higher education must increase faculty understanding of copyright law and work to bring faculty self-archiving practice into closer alignment with publisher policy. Perhaps the key issues are awareness and respect—from both the author's perspective and the publisher's.

Many faculty members are simply not aware of publisher policies.[19] Many have a meager understanding of copyright. Some faculty have little respect or concern for publisher policy or copyright.[20] To raise awareness, we plan to disseminate policy information, including resources for locating policy information, and to let faculty know that liaison librarians can assist them in locating and interpreting policies. We will continue our ongoing efforts to educate faculty about why copyright is important, how it works, and what they need to do to protect their rights as authors. In addition, we need to help faculty understand why the university's copyright policy matters to them and to the institution, why there are serious penalties for copyright infringement, and what those penalties are. Aggressive efforts to provide faculty with information about publisher policies and copyright law might convince them that policy and law are important but may, nevertheless, fail to persuade them to change their behavior. Research might help us identify strategies to persuade faculty to act based on their conviction. However, until publisher policies become less burdensome on the faculty, it is this author's belief that achieving compliance will be impossible, and the cost of attempting to increase alignment will exceed the benefits.

The many publisher policies encountered in this study raise questions of whether publishers are aware of the difficulties their policies present to faculty or how little understanding or respect their policies exhibit for faculty. The number of different policies and their significant variations, both in vocabulary and stipulations, can confuse and discourage faculty compliance. Given the interdisciplinary focus of much current research, the tendency for faculty to not try to negotiate copyright transfer terms, and the availability of standardized author addenda for those who do, the number of different publisher policies that faculty encounter is probably greater than the number of different author addenda to publishing agreements that publishers encounter. Nevertheless, publishers lament the number of different author addenda and often reject them outright. Their rejection suggests that they either have not considered or do not care about the confusion that authors encounter in dealing with publisher policies.

In many cases, publisher policies that purportedly allow open access seem designed to actually discourage self-archiving practice. The work required to meet the various picayune conditions and restrictions increases the time it takes to self-archive an article. Complying with embargo periods, which differ not only from publisher to publisher but also from journal to journal published by the same publisher, means keeping a schedule of what can be self-archived when. Many policies require maintenance of the

self-archived work over time, for example, taking down a preprint and replacing it with a postprint. Faculty have more important work to do, and not all of them have support staff to assist with the clerical work of self-archiving. This disrespect for their time does not encourage respect for publisher policy.

Convoluted publisher policies prevent faculty and publishers from working with them effectively and efficiently. The complexities discourage faculty compliance and prevent publishers from automating assessment of compliance with their policies. This author believes, based on her experience participating in public roundtable discussions of orphan works and proposed changes to Section 108 of U.S. copyright law, that publishers are quite capable of being disingenuous.

With hard work and massive campaigning, we should be able to convince faculty that self-archiving their work within the confines of policy and law will benefit them and their disciplines and protect them and the institution. The more difficult challenge is persuading them to act on these convictions. To motivate the faculty to self-archive their work in alignment with policy and compliance with law we must make the task quick and easy to accomplish and personally valuable to them. Providing good tools, resources, and support services can help make the task less onerous. An important resource component will be guidance from legal counsel on what constitutes sufficient alignment with publisher policy to qualify as compliance. Making the task personally valuable to the faculty will require several approaches.

Data on downloads from institutional repositories or citation counts for open access articles can demonstrate to faculty the value of open access. The importance of managing their copyrights immediately becomes evident when faculty encounter limitations on what they can do with their own work after having transferred to a publisher exclusive rights to re-use or distribute it. The former is a carrot; the latter the proverbial stick. The stick quickly and painfully illustrates the value of original copyrights and why selecting a publisher and negotiating a copyright transfer agreement must be done with great care. The limitations on what faculty can do with their own work will come to the forefront as we work with them to populate the institutional repository.

Many of the journal articles that have already been self-archived by Carnegie Mellon faculty cannot simply be harvested for deposit in the repository because of the lack of alignment with publisher policy. In some cases, self-archiving is prohibited by policy. In other cases, the version of the article allowed by policy might not be available. Recruiting content for the repository presents an excellent opportunity to discuss publisher policies and the importance of copyright transfer agreements with the faculty. Faculty are free to continue their current self-archiving practice using personal or departmental Web sites; but, if they want the showcasing, maintenance, and preservation provided by the libraries' institutional repository, they must more closely attend to policy and law. Knowing that faculty Web sites are deleted after they leave the university and that the maintenance of departmental servers varies over time, some faculty interviewed in 2006 expressed concern about the preservation of their "legacy." Leveraging this concern about legacy could help persuade faculty to take the appropriate actions.

Meanwhile additional research is needed to improve our understanding of the factors that influence faculty self-archiving behavior. Identifying these factors and their correlations can help us fine-tune our educational initiatives and support services to

achieve our goals. Modifying faculty behavior requires patience, persistence, and a thorough understanding of their needs, expectations, constraints, and values—which are formed and informed not only by disciplinary culture but also by institutional and personal idiosyncrasies.

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15. Though departmental policies vary widely, the Carnegie Mellon policy on teaching-track faculty does not have a strong expectation of publication. An analysis of the study results by faculty track would likely indicate that faculty with no publication lists linked to the departmental home page were primarily faculty on the teaching track.

16. For example, interviews of Carnegie Mellon faculty conducted in 2006 indicate that men are more likely than women to self-archive and that research-track faculty are more likely than tenure-track faculty to self-archive. See Troll Covey, "Faculty Rights and Other Scholarly Communication Practices."

17. The SHERPA/RoMEO color code definitions and caveat about embargo periods are available at http://www.sherpa.ac.uk/romeoinfo.html#colours (accessed February 5, 2009). For examples of publishers that allow self-archiving of preprints and postprints but are coded as yellow publishers, see the SHERPA RoMEO entries for Sage and Taylor & Francis.

18. Antelman, 90, 92.

19. Swan and Brown, 48.

20. Troll Covey, "Faculty Rights and Other Scholarly Communication Practices."