

Final Report to The Andrew W. Mellon Foundation

Measuring Faculty Attitudes towards Electronic Resources: Ithaka Research Study

May 26, 2005

In the fall of 2000, JSTOR retained the research firm Odyssey to investigate faculty attitudes related to information resources, the transition to electronic journals, and JSTOR itself. The findings from that study were instrumental in helping JSTOR to assess its progress and consider new directions as its first collections were being completed. In addition, JSTOR was able to engage the academic library community to share and discuss some of the most relevant findings.

In 2003, with nearly three years having passed, it seemed timely to undertake a new study of faculty. In the intervening three years, the electronic transformation had accelerated dramatically, and a more fundamental reconceptualization of the role of print – and of libraries themselves – was emerging. We thought it would be desirable to update some of the findings from 2000, to see how faculty attitudes had evolved on key issues. In addition, with JSTOR, ARTstor, and the incubating entities launching and planning a variety of new services in the near future, we also sought to explore several areas that we perceived to have strategic importance to Ithaka and our Affiliates.

Odyssey agreed to work with us again on a revised and expanded survey. The Andrew W. Mellon Foundation supported the majority of the costs of the study, with JSTOR also making a major contribution in recognition of the value of this sort of research to it, and Ithaka contributed staff time and the remaining balance. This report summarizes the most significant findings, and describes how these findings have contributed to our own work.

### **Background and New Features of the 2003 Survey**

In planning the 2003 study, we considered adding several features beyond those that had been included in the 2000 study. We sought to expand the breadth beyond the US, given the increasingly international nature of the academic community and JSTOR's

participants, but this proved too difficult to execute successfully. We also sought to permit robust disciplinary stratifications which, fortunately, we were able to develop. In 2000, Odyssey provided analysis for several disciplines that had sufficient respondents, and the usefulness of this approach led us to design the 2003 study with disciplinary analyses in mind. In 2000, we were able to analyze responses from mathematicians, economics, and humanists, which allowed us to discover interesting differences in how these disciplines were transitioning to an ever-more electronic environment. In 2003, we focused on disciplinary analysis during the planning process, and as a result were able to obtain discipline-by-discipline stratifications for nearly every discipline we targeted for analysis.

To achieve this, and for several other reasons, our sample size was increased substantially (from 32,670 booklets mailed in 2000 to 44,060 in 2003). We added a number of new disciplines, including those with journals newly included in JSTOR or under consideration, some new areas of the sciences, and all the area studies fields (with Aluka in mind). We oversampled on a number of ARTstor-related fields in order to ensure adequate responses among art historians, architects, and archaeologists for disciplinary-level stratifications. We included faculty from all US 4-year institutions, a somewhat broader base than in 2000. All in all, our targeted population was broader than it was in 2000, and we feel this has made it even more broadly representative of US academia.

Faculty names and contact information were obtained from a mailing list broker, selected randomly within the disciplines and higher education institutions that we had selected. William G. Bowen's preliminary letter introducing the study to each recipient was mailed on September 23, 2003. The survey booklets themselves, also with a covering letter from Bowen, were mailed on September 29, 2003. The cut-off date for responses was November 12, 2003. By that point, 7,403 completed surveys were received.

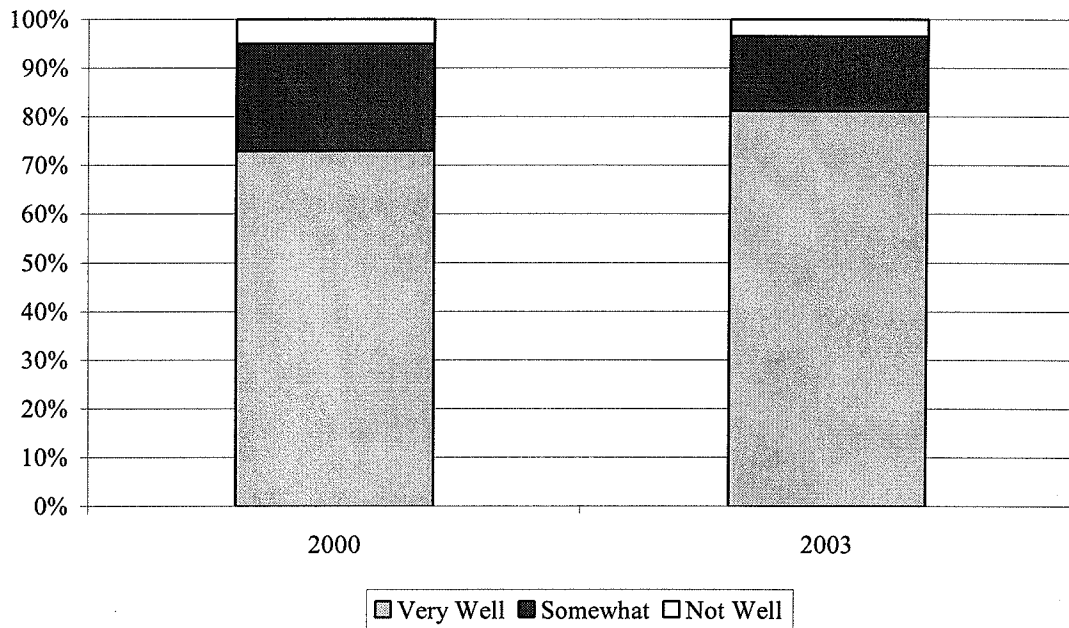
The overall response rate to the study was 16.8%. By academic standards, the findings developed by our study are not statistically significant, due to the rate of response and our inability to estimate any potential response bias. But the technological environment is

changing rapidly, and this study was designed to collect and analyze data on current and emerging trends very rapidly. The market research techniques that Odyssey has developed involve asking similar questions in multiple ways, allowing for “triangulation” of current views. By comparing the answers to similar questions, evidence of consistency emerges that enhances the confidence we have in findings even at what academic researchers consider low response rates. The results that are discussed in this report, and that we have shared publicly, are broadly consistent across multiple questions. We believe they have considerable value as inputs into strategic planning for librarians, information technologists, and others interested in scholarly communications.

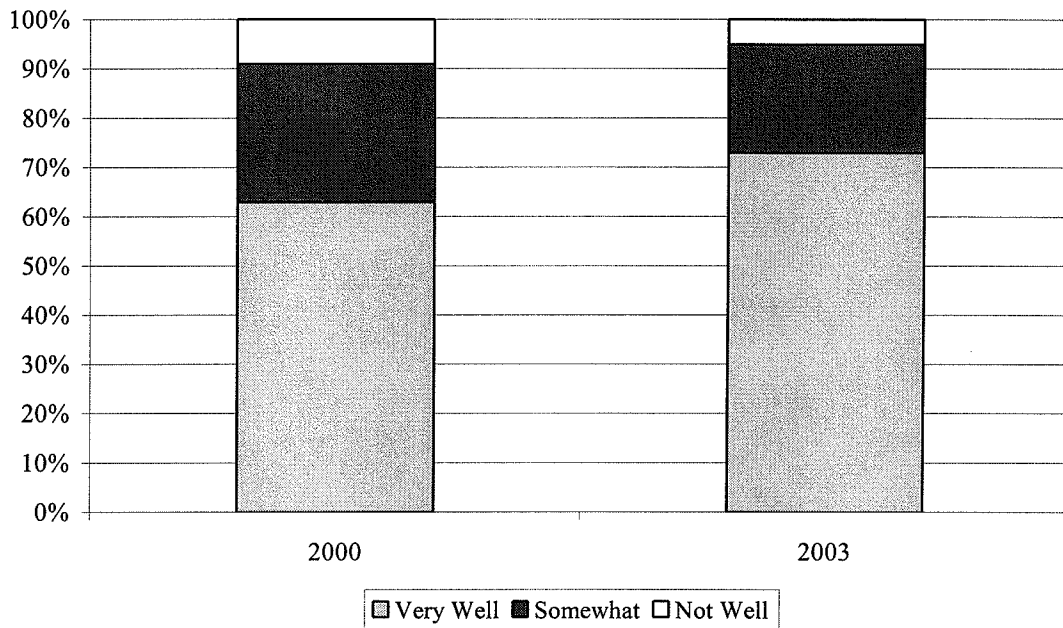
### **General Findings**

In working to update the findings from the 2000 study, we were hoping to understand how the landscape for electronic resources and information services might have changed in the past three years. We were interested in how the much-heralded transition towards electronic formats, along with the budgetary challenges faced by many institutions during this period, might have affected faculty attitudes and preferences. To do this, we included many of the most valuable questions from 2000 in our 2003 survey booklets.

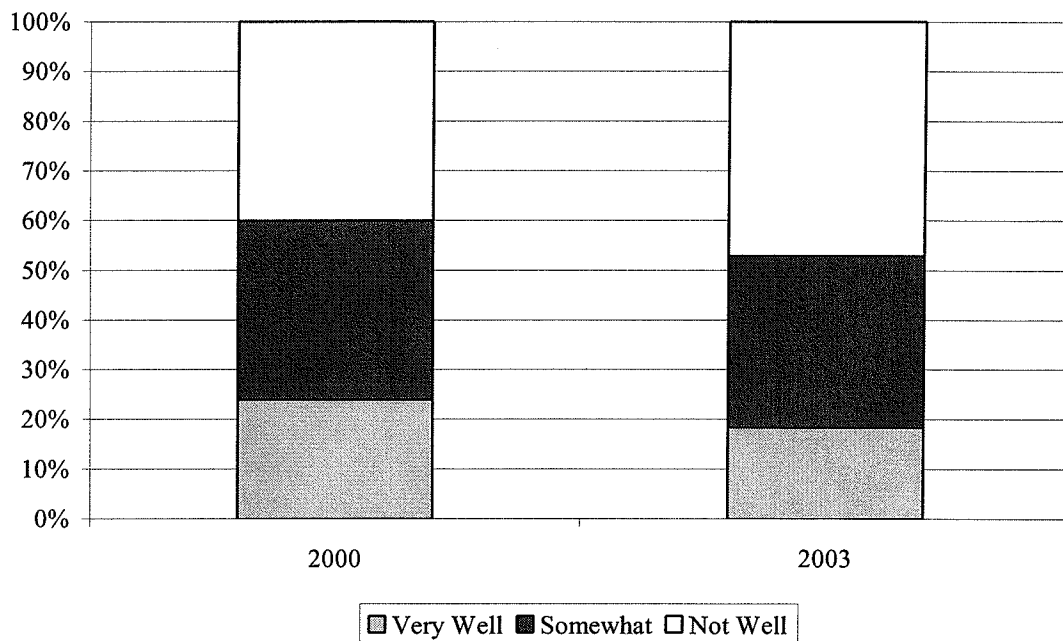
Many of these questions were attitudinal questions, where we presented faculty members with a strongly-worded statement and asked that they rank how well the statement agreed with their own views. Results from several of these questions are illustrated below, in Figures 1, 2, and 3. Each of these three questions illustrates how the transition to electronic resources is proceeding and that resistance to them is dissipating.



**Figure 1 “Electronic research resources are invaluable research tools.”**



**Figure 2 “I will become increasingly dependent on electronic research resources in the future.”**

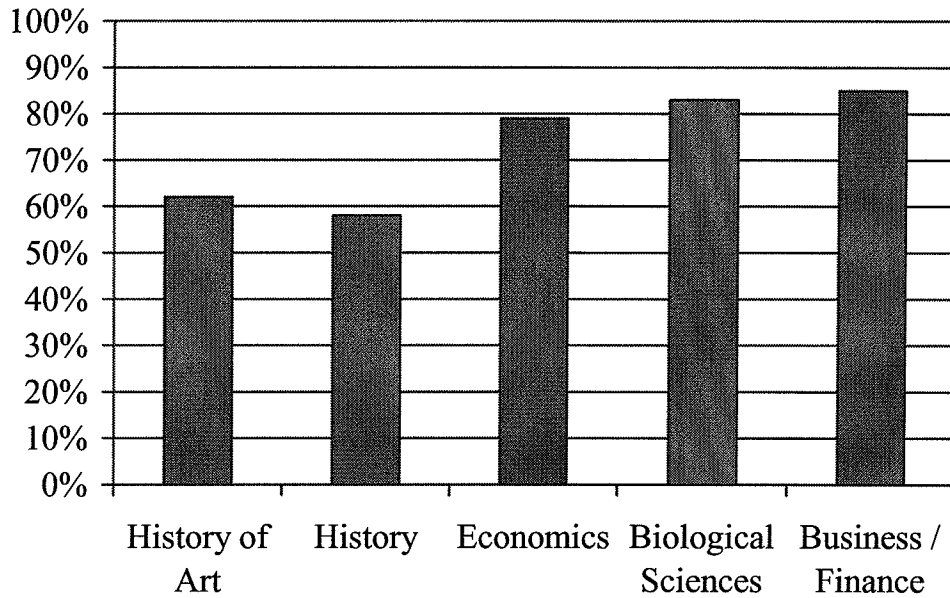


**Figure 3 “I’d prefer to just use hard-copy collections of journals rather than use electronic archives.”**

In 2003, 80% of faculty recognized the “invaluable” nature of electronic tools for research and 70% were convinced that they would become more dependent on them. Perhaps most notably, 50% strongly disputed the suggestion that they preferred hard-copy journals. Although none of these findings was dramatically changed in three years, the steady consistent trend in these and numerous other similar questions was towards greater reliance on electronic materials, with the print becoming steadily less important.

In Figure 4, we present findings for the attitudinal question in which we suggested bluntly that faculty members would become more dependent on electronic resources in the future. Here, as in several other graphs later in the report, we present results from five disciplines that are used to illustrate some of the broader disciplinary differences. While faculty members in all disciplines agreed with this statement, the degree of unanimity differed noticeably by discipline. Specifically, those disciplines that already make extensive use of electronic resources expected the electronic transformation to continue almost unanimously. Nevertheless, faculty members in disciplines that have made less

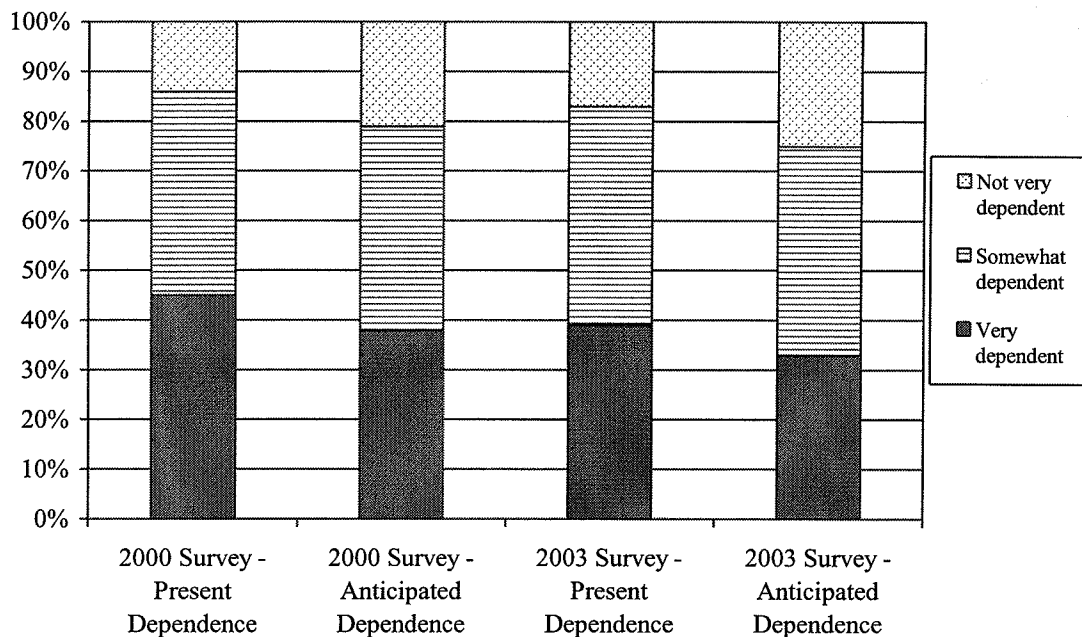
extensive use of electronic resources also believed that they would become more dependent going forward, although at a much lower rate.



**Figure 4 “I will become increasingly dependent on electronic research resources in the future.”**

The differences that are evident in this figure between history and history of art, on the one hand, and economics, biological sciences, and business/finance on the other, are indicative of the extent to which the digital transformation has affected each. In question after question getting at faculty adoption of, satisfaction with, and expectations of electronic research resources, the same differences are evident. Faculty in the sciences, and in some of the social science fields, have transformed their research practices to take advantage of digital resources. In comparison with some of the findings from 2000, we believe that several social science disciplines, including economics, have transitioned to a much greater adoption of digital resources in these intervening three years. In the case of economics, there are several new research resources that have undoubtedly contributed to this relatively rapid transformation. Among the humanities and the humanistic social sciences, however, no such complete transformation is yet in evidence.

The transition to electronic resources raises dilemmas about perceptions of the library, and its role, in the new environment. As in 2000, we asked a number of questions regarding these perceptions. Figure 5 illustrates the findings on the question of perceived dependence on the library, a question that was asked in both 2000 and 2003 in the present and future tense. Faculty anticipation in 2000 of their reduced dependence in five years hence was in large measure borne out in the 2003 study. It is therefore even more compelling to consider the implications of an anticipated further reduction in dependence going forward. In an era of vastly increased competition among information services, a decrease in dependence on any one source cannot be all that surprising; nevertheless the implications of the perception are deserving of consideration.



**Figure 5 "How dependent would you say you are [will be in five years from now] on your college or university library for research you conduct?"**

Another question that targeted competing information sources, but less in perception than in practice, examined how faculty members understand themselves to begin their research on a given topic. The starting points from which we asked them to choose – the library building, your online library catalog, an Internet search engine, and a specific electronic

research resource – were designed to serve as a simple gauge of research strategies. In Figure 6, the responses are stratified by the four disciplinary groupings. It is clear that area studies and humanities faculty have broadly the same research strategies, relying on the online library catalog far more than do other faculty members and also beginning at the library building more frequently: in both cases, this suggests a greater dependency on books and print resources as compared with journals and electronic resources. At the other extreme, scientists are more likely to begin their research at a specific electronic research resource, such as Medline, but least likely to begin with the local library catalog: suggesting a preference for electronic resources and journals. Social scientists fall between the two extremes, perhaps because some social science disciplines (economics and sociology, for example) prefer electronic resources and use journals whereas others (anthropology and linguistics, for example) tend to have a greater reliance on books and, as a result, print resources. Research strategies continue to differ noticeably across disciplinary groupings, and will probably continue to differ, given the ways in which scholarly communications needs vary.

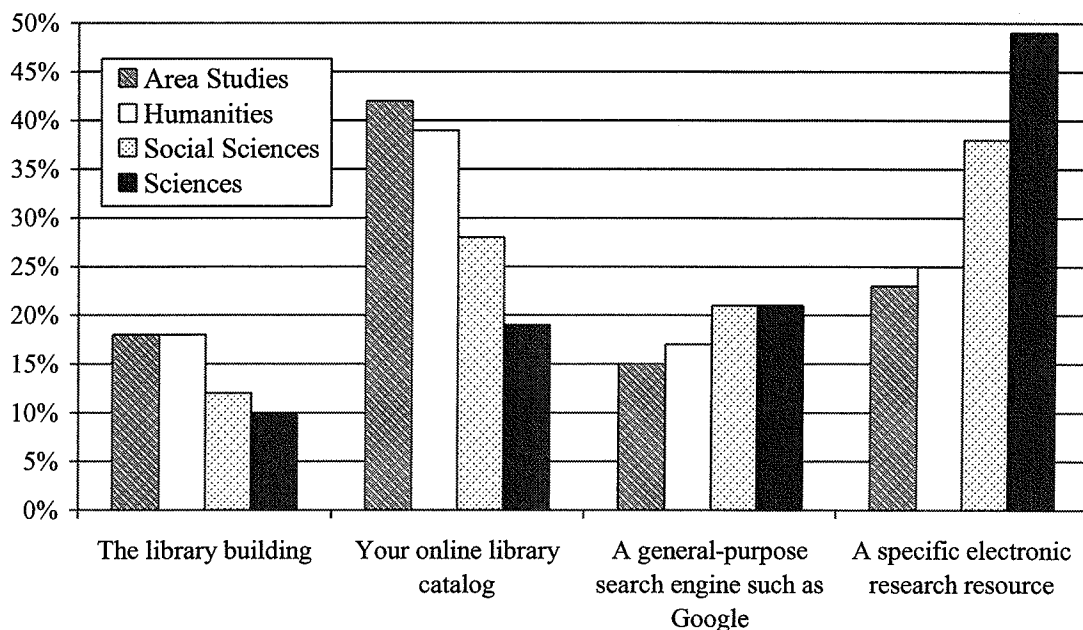


Figure 6 “Typically, when you are conducting academic research, which of these four starting points do you use to begin locating information for your research?”

This section has sought to give an overview of some of the important general interest findings of the 2003 study. In updating the findings from JSTOR's 2000 study, the present 2003 study was able to identify trends and to examine how expectations played out in reality. We also were able to extend this analysis by providing much more detailed disciplinary breakdowns. In sharing all these general-interest findings before a number of audiences (detailed in a section below), we have been able to contribute to some of the most important discussions underway in the academic library community.

### **JSTOR's Place in the Market**

In addition to the general-interest findings, we targeted several areas of strategic interest. Many of these strategic angles were new to the 2003 survey, but one also appeared in the 2000 study and therefore permits trend analysis on several questions. This was the strategic question of JSTOR's place in a rapidly-changing marketplace.

We found that awareness and use of JSTOR grew significantly in three years, but that these factors varied widely by discipline. We also found that users' views of JSTOR have become significantly more positive, due in part to the addition of so many more journal titles in the three years between the two surveys. Indeed, some 44% of its users now consider JSTOR to be a primary starting point for academic research, rather than a secondary destination. Nevertheless, in an environment in which so many new online resources have become available, JSTOR's "market share" has not kept pace (where market share is measured as the share of total reported uses of electronic resources that a faculty member attributes to JSTOR). Although Odyssey was somewhat alarmed by this finding, we view it as relatively natural, given that JSTOR was truly a first mover in this environment. When asked about the various research resources that they use, faculty members selected JSTOR more than any other resource but Lexis-Nexis; and at currently participating colleges and universities it was in first place, used by over 45% of responding faculty members. Although JSTOR operates in an electronic marketplace that grew significantly more complicated over the course of three years, we believe that the

survey results confirmed that JSTOR's growing number of library participants and new collections were being, on balance, well-received and well-used by faculty members.

But the findings do not suggest that JSTOR should rest on its laurels. There is demand for an expansion in the number of journals included in the archive, and roughly half of users said that including current issues of journals would lead them to use JSTOR much more frequently than they do now. The findings from the study were one of the factors leading JSTOR to undertake major software and interface improvements, and they argue for consideration of current issues as a possible area of growth for JSTOR in the future.

Odyssey's view on these issues, as well as on many of the other strategic issues discussed here, can be found in the slide presentation which is included as a supplement to this narrative report.

### **Image Use and the Role of ARTstor**

The survey questionnaire was developed as ARTstor was entering its beta-test period, and there were many pressing questions to try to address. ARTstor was particularly interested in how it might be viewed by faculty in disciplines outside of its core constituency of art historians, architects, and archaeologists. For this reason, the ability to provide disciplinary stratifications was a particularly important feature for ARTstor. Working closely with ARTstor and Odyssey, we developed a series of questions to try to understand image use in both digital and traditional formats, impediments to the use of digital images, and the features most desired in a collection of digital images.

We found that the humanities disciplines outside the ARTstor core disciplines of art history, architecture, and archaeology were broadly interested in the ARTstor service. Across the humanities disciplines, 80% of respondents had a "very good" or "excellent" initial impression of the ARTstor concept, and 60% said they would use it when it became available. But even in the sciences, the concept was rated very good or excellent 55% of the time, and more than 15% of respondents intended to use ARTstor. (In the

social sciences, 35% expected to use it.) Since then, ARTstor has positioned itself as a campus-wide resource, one that can have value across the disciplines.

In examining the desired features of a digital image collection, we confirmed a critical issue that ARTstor staff had long suspected: Art history is the only discipline whose faculty find fine detail of images to be of paramount importance, compared with deeper collections and robust subject cataloging. This was of significant importance, since art historians frequently urged ARTstor to focus on image quality, an expensive proposition. Even in the humanities broadly, fine detail was judged extremely important only by slightly more than 40% of respondents, as compared with 70% judging subject cataloging to be extremely important. ARTstor has recently devoted further resources to its metadata, including the creation of robust “crosswalks” across collections allowing for the best possible user experience.

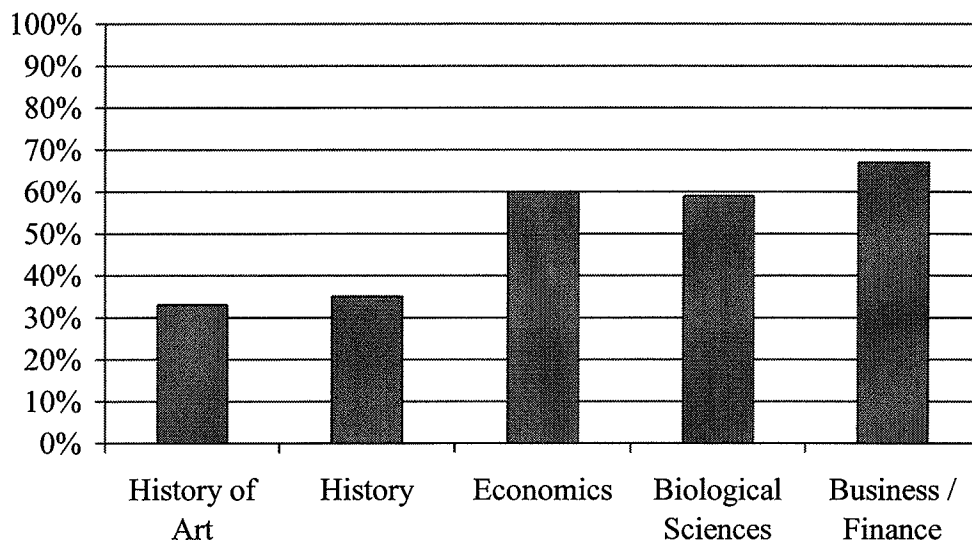
Since this study was conducted, ARTstor and NITLE have commissioned Ithaka to study the use of images at liberal arts colleges participating in the hosting pilot project. Many of the ARTstor-related questions have provided significant context to that research study, which is being completed this quarter.

### **Electronic-Archiving**

In Fall 2003, the Electronic-Archiving Initiative was under active development and transitioning from a JSTOR unit to an Ithaka incubating entity. On many levels, including economically, we were investigating whether the development of an acceptable electronic-archiving solution would be in the interest of key stakeholders. Our faculty survey sought an answer to this question from faculty members.

Perhaps most importantly, we wanted to understand whether faculty members were ready for a complete transition to electronic journals. We asked a number of questions seeking to explore this terrain, some of which were mentioned above in the section on “General Findings.” Most bluntly, however, we asked them if they would be “fine” with the cancellation of print versions so long as e-journals are available. Figure 7 illustrates the

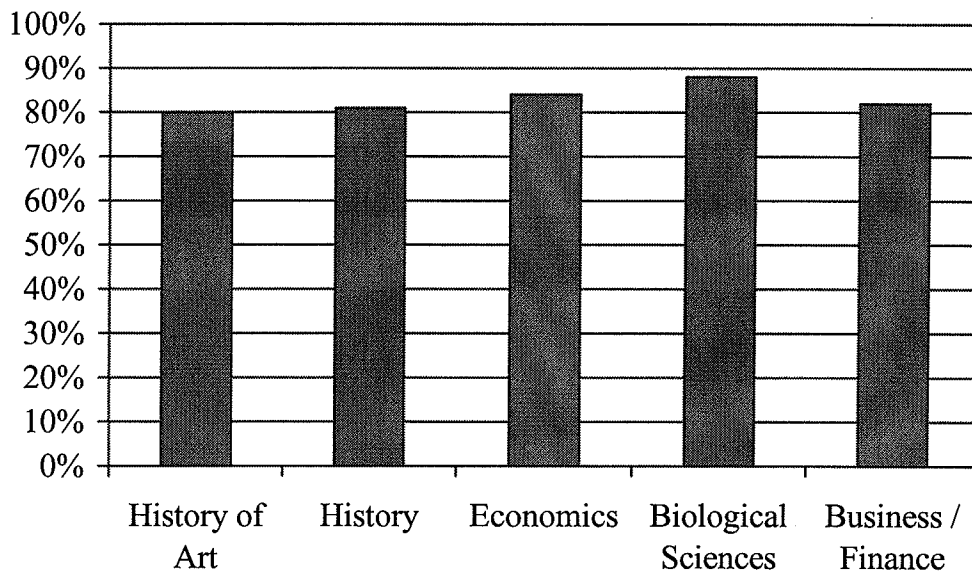
findings for the five “representative disciplines.” The degree of enthusiasm varies by discipline, with a majority of economists, biologists, and, even more so, faculty in business and finance, among the enthusiasts. Only about a third of faculty in the humanities disciplines believe that the statement represents their view very well. Although it is not surprising to find that humanists are not yet ready for a complete transition to electronic, this question focused not on all resources but on journals, which are of far greater importance in the disciplines that are willing to see print versions cancelled. In other words, the very importance of a journal to a discipline may encourage faculty to be enthusiastic for a transition, precisely because the new features that the electronic medium permits outweigh the difficulties of transitioning from a familiar environment.



**Figure 7 “If my library cancelled the current issues of a print version of a journal but continued to make them available electronically, that would be fine with me.”**

Recognizing that faculty in some disciplines are at a transition-point to digital format, we were particularly interested to see the results of the questions we asked about electronic-archiving itself. There were a number of such questions, and faculty answered them with almost uniform enthusiasm, whether stratified by discipline, by institutional size, or by

other factors. Figure 8 shows that faculty from all five representative disciplines endorse electronic-archiving across the board. It is important to note that we did not present faculty with any trade-offs in asking this question; they did not have to consider the costs involved with an acceptable electronic-archiving solution. Nevertheless, findings like these have been very valuable to the Electronic-Archiving Initiative in conversations with libraries and publishers as it prepares to launch its Portico service.



**Figure 8 “With more and more journals becoming available electronically, it is crucial that libraries, publishers, or electronic databases archive, catalog, and protect these electronic journals.”**

More generally, we found in analyzing a number of different questions on preservation and archiving that there was a great deal of uncertainty and confusion about preservation practices and policies. For example, there was significant confusion about the status of current electronic-archiving solutions, suggesting that little information on this topic had made its way to faculty members. In addition, the answers to several questions were inconsistent in a way that suggested to us that many faculty members lack an adequate understanding of the relationship between collecting local print copies and the existing distributed print preservation system. We concluded that there is much confusion about preservation and archiving among faculty members, and we recommended that E-

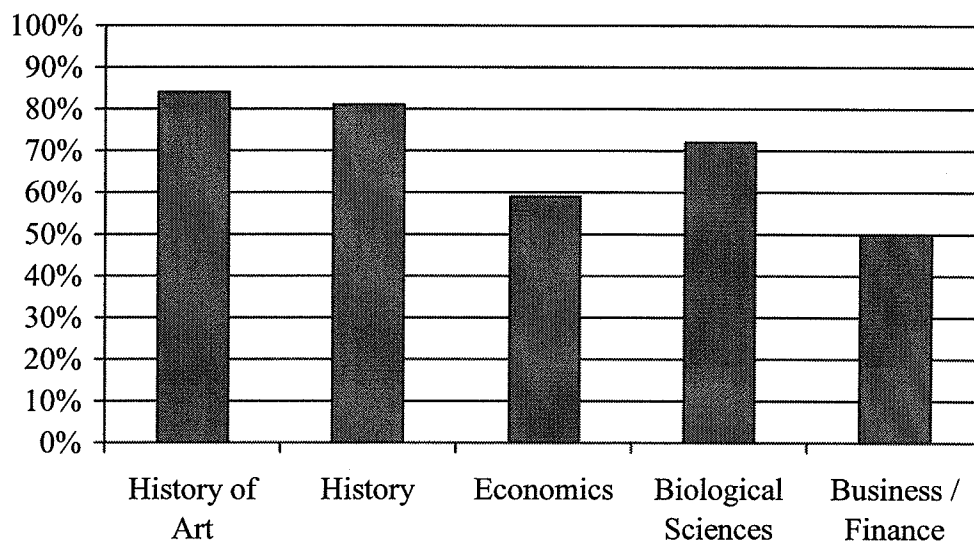
Archive, as well as librarians, work to educate faculty members whenever possible about the existing preservation system and how preservation might best be assured in the future for both print and electronic materials.

### **Paper Repositories**

Figure 7 suggested that the cancellation of print editions of electronic journals would be generally acceptable to faculty in many social science and science disciplines. And several questions related to archiving indicated that faculty members care a great deal that research materials remain available for future generations of students and scholars. Yet as digitization by commercial and not-for-profit organizations continues to bring more material online, some libraries have faced hard questions about whether they must also maintain local copies of legacy print collections. As a result, the existing preservation system for print has to some observers begun to seem increasingly fragile. We therefore sought to understand faculty attitudes towards local versus remote storage of legacy print collections, in an effort to gauge acceptance of paper repositories such as the ones that JSTOR has, since the survey, developed with library partners.

We asked several questions to explore the attitudes of faculty members towards “legacy” print collections such as hardcopy journal backfiles. As Figure 9 indicates, the humanities disciplines are nearly unanimous in believing that at least some libraries should maintain print versions, perhaps not surprising given their reliance on the print. In economics, business, and finance, a (bare) majority of faculty members would like to see some print versions maintained. But biologists appear to be far more cautious than might be expected of them, given how similar they are to the other science and social science disciplines on so many other matters. Anecdotal inquiry suggests that this aberration is due to the dependence of biological scientists on images for their scholarly communications – and in much the same way as art historians would, almost of necessity, be concerned about image quality, so are many biological scientists. Since, other than on this key point, biologists have achieved a significant transition to electronic resources, making a comparison with art historians might be a useful extension of our analyses. This might further help resource providers to develop solutions that will be valued by

biological scientists, while providing some context for librarians interested in how to best serve the different disciplines.



**Figure 9 “Regardless of How Reliable and Safe Electronic Collections of Journals May Be, It Will Always Be Crucial for Some Libraries to Maintain Hard-Copy Collections of Journals.”**

We have recently been asked to participate in conversations to consider options for a framework connecting individual paper repositories. One contribution we intend to make is to analyze the data generated by this study to learn in as complete a way as possible what we might expect of faculty reaction to a paper repository system, and what planning considerations might therefore be take into account. Preliminary analysis for this purpose suggests that there is a wealth of material available.

### **Open Access**

When we designed the survey, the Open Access movement was gathering steam. Its calls for scholarly materials to be made freely available on the Internet, with funding coming not from the demand side but from the supply side or elsewhere, has been interpreted in some quarters as suggesting that JSTOR’s business model is no longer adequate. The dominance of Google, and the necessity for so many resources to be included in its index

if they are to be accessible to the majority of users, also may push some scholarly resources in a similar direction. Some of our efforts to address these types of strategic dilemmas were discussed in the section above on “JSTOR’s place in the market”; for example, we sought to understand whether JSTOR was a destination resource for scholars or one that they reached it through links from elsewhere. In addition, we were eager to take the opportunity presented by the faculty study to marshal more direct data on the prospects of the Open Access movement.

We therefore worked with Odyssey to attempt to understand the characteristics that faculty view as most important in their scholarly communications system. We sought to understand the relative importance of various features of scholarly journals, such as having wide circulation and readership, offering acceptable assurance of preservation, charging no fees to authors, being available at no cost on the demand side, being highly selective in accepting articles, and being widely accessible in the developing world. Unfortunately, these questions did not result in strong findings. In retrospect, we can see that they should have been designed to force the respondent to select among trade-offs, for example, requiring a respondent to choose between free on the demand side or free on the supply side. Our inability to develop findings salient to the strategic area of scholarly publishing business models was the only significant disappointment to us in the expected outcomes of this study.

### **Public Presentations and Publications**

The results of this research study offered value well beyond Ithaka and its Affiliates. Although some of the areas of strategic interest were proprietary and could not effectively be utilized by others, we have attempted to share the bulk of our findings in a variety of ways. Because of our ability to analyze the findings for each question along a number of stratifications, we were able to customize presentations for many different audiences.

Internally, Ithaka’s research staff prepared an overview of findings for each affiliate – JSTOR, ARTstor, Aluka, and E-Archive. These strategic overviews were presented at

staff or liaison group meetings and inspired spirited discussions about the implications of our findings. More recently, we have been working to prepare an overview that could be useful for NITLE – even though no strategic questions were asked on NITLE’s behalf, given that it was not yet affiliated with Ithaka.

The first presentations derived from this study were shared with audiences generally interested in the research. Ithaka staff presented a version of the findings to a CNI task force meeting (slides that were subsequently posted online) as well as to a group of research university library directors convened at Ithaka. We also presented a customized version at a CLIR invitational meeting on how library spaces and services should be reconfigured for teaching purposes, where we attempted to present findings that addressed how faculty’s teaching needs might differ from their research needs.

In addition, the library relations group that serves both JSTOR and ARTstor has found the study to be of significant interest in its presentations to librarians. Its staff has used the findings for this study in number of meetings, including gatherings of US and UK library participants. It has also used select findings in a number of publication opportunities. And JSTOR’s publisher relations group has found it useful to present selected findings to its publisher participants, as well as at a talk before The Art Libraries Society of New York for which Ithaka staff helped develop custom stratifications of art historians. We were also able to prepare custom stratifications for a scholarly journal participating in JSTOR that was undergoing a strategic review.

Finally, the Electronic-Archiving Initiative has used a number of the findings from the study in preparing conversations with publishers and librarians about its work.

### **Conclusion**

The analysis of the findings from this study has not been simple. Odyssey provided us with roughly 1,600 pages of detailed tabulations, and we have requested several custom tabulations beyond these. We have striven to mine the study for all the wealth it can provide, and we have not been disappointed by the depth or the breadth of the findings.

Even amid all this data, several key non-proprietary areas have proven to be among the most provocative for further consideration and exploration. First, disciplines appear to be evolving towards electronic resources at different rates, but all moving in the same direction nevertheless. This raises important considerations about “cyberinfrastructure” for the disciplines that have yet to make this evolution, including some of the humanities and humanistic social sciences. Second, even as preservation and archiving issues become more pressing, faculty experience significant confusion about the implications of various policies. How can faculty members best contribute to a dialogue that is of critical importance to their work but for which they are not all that well-prepared? Finally, even as libraries struggle valiantly to provide adequate levels of so many new resources for their readers, faculty members seem to be increasingly unable to recognize the value of the library in its rapidly-changing role. The strategic dilemmas facing libraries have become ever more readily apparent since the 2000 study, and yet the path forward for them has not yet become clear. In reviewing our findings, and in presenting them to a variety of different audiences, these three themes have emerged as among the most important for ongoing consideration. Through a variety of our Affiliates, including Aluka’s and ARTstor’s core programs, JSTOR’s development of paper repositories, NITLE’s efforts to bridge the librarian-technologist divide, Ithaka’s research into paper repository frameworks, and the Electronic-Archiving Initiative’s imminent launch of its Portico service, we are working to address some of these considerations, as well as to bring them to the attention of others in the higher education community. The faculty study was invaluable in informing our work.

Even today, a year after the findings from the study first became available, we continue to find opportunities and requests to make use of it. The comparison with 2000 and the detailed disciplinary stratifications that are possible in the 2003 survey are unusual in studies in this area. Our ability to shed significant light on the attitudes of humanists and area studies faculty is, in particular, an unusual advantage. We have therefore been told that, in addition to whatever value this study has had to leaders in the Affiliates and to

policy-makers more broadly, it also has historical value in capturing the attitudes and opinions accompanying this transitional period for higher education.

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