Journal of Librarianship and Scholarly Communication

Volume 2 | Issue 2 eP1110

Exploring Video Abstracts in Science Journals: An Overview and Case Study

Scott Spicer

Spicer, S. (2014). Exploring Video Abstracts in Science Journals: An Overview and Case Study. *Journal of Librarianship and Scholarly Communication* 2(2):eP1110. http://dx.doi.org/10.7710/2162-3309.1110

JLSC is a quarterly journal sponsored and published by Pacific University Library | ISSN 2162-3309 | http://jlsc-pub.org

ISSN 2162-3309 JLSC

RESEARCH

Exploring Video Abstracts in Science Journals: An Overview and Case Study

Scott Spicer *Media Outreach and Learning Spaces Librarian, University of Minnesota-Twin Cities*

Abstract

INTRODUCTION The video abstract has emerged in recent years as a new way of communicating the results of scholarly enquiry. For library-based journal publishers who want to support multimodal scholarship, it is useful to understand the potential benefit and impact of incorporating video abstracts into their publications. This paper provides an overview of the growth of video abstracts in science scholarship, and presents a single journal case study that compares the use and potential impact of video abstracts hosted on both YouTube and on a journal's own website. **METHODS** For the case study, video abstract usage data for the *New Journal of Physics* (NJP) was gathered from both YouTube and the NJP native platform and then correlated using a Spearman rank correlation coefficient test to analyze viewing usage. Viewership data from both platforms was also correlated with article usage counts using Spearman to study the relationship between article usage and corresponding video abstract usage. **RESULTS** Users predominantly accessed the journal's hosted video abstracts instead of the abstracts posted on YouTube. However, there was a moderate positive correlation comparing view counts of the same video abstracts across both platforms, suggesting proportionate use of both platforms. In addition, the top 25 and 100 read articles had a significantly higher presence of video abstracts than articles overall in the data set, although a specific reason for that relationship cannot be identified. **DISCUSSION & CONCLUSION** Video abstracts are a natural evolution of science communication into multimodal environments. Publishing trends will likely continue to grow gradually, with appreciation for non-traditional scholarship (multimodal scholarship) and new measures for assessing impact (altmetrics) potentially encouraging greater adoption. Library-based journal publishers should consider investing in software that offers dynamic media integration, offering the video abstract option to their authors, and leveraging YouTube to further raise the visibility of their authors' research articles and publication. Library-based publishers should have some expectation that the video abstracts will be viewed relatively proportionally across platforms (i.e. a video abstract that receives a higher or lower view count on the journal's website is moderately more likely to also receive a higher or lower view count on YouTube), with the majority of total views (for all videos) coming from the journal's website. Subject and media librarians should become more aware of these emerging practices to support the video abstract publication and creation needs of their research communities.

Received: 10/09/2013 Accepted: 03/07/2014

Implications for Practice:

- Library-based journal publishers will benefit from understanding the potential of the video abstract genre for their authors to communicate their research through a personal, media rich medium.
- Library-based journal publishers will benefit from understanding the potential of video abstracts to further promote the research of their authors through streaming platforms such as YouTube.
- Library-based journal publishers should consider journal hosting platform software that offers video integration capability alongside text and other formats.
- Librarians will benefit from understanding the potential of video abstracts as a form of multimodal scholarship, as well as the ways in which "altmetrics" may be used to measure the impact of these works, in order to better advise their researcher communities on methods of increasing the visibility and impact of their scholarship.
- Academic media librarians and library-based media professionals that offer campus media production support services would benefit from promoting their services to researchers interested in producing video abstracts for publication.

INTRODUCTION

Advances in digital media technologies and the increased ubiquity of online media content have presented unprecedented opportunities for scholars to share their research through new genres and mediums of communication. For the purposes of this paper, such *multimodal scholarship* will be defined by the use of multiple digital mediums (e.g., still and moving images, interactive digital objects, audio, data sets, geospatial data, and text), often composed, displayed, or linked together, and disseminated across an array of digital publishing platforms (e.g., websites, blogs, mobile applications, and social networks), in order to communicate research. Multimodal scholarship strives to communicate digital information in ways that previously would have been impossible to bring about new understanding, awareness, and discussion of research.

This environment presents new opportunities and challenges for libraries seeking to support the emerging needs of their scholars. For example, current publishing software, such as Hydra, Digital Commons, and the audiovisual @mire module (used with DSpace), offers the ability to embed media with text and other formats. However, while most of the institutions listed in the 2014 *Library Publishing Directory* claim to offer publishing capacity for a variety of media formats ("Library Publishing Coalition," 2013), a sample review of several publications cited in the *Directory* suggests that the practice of enhanced multimodal publishing (e.g., embedded video with text) is still relatively nascent in library-hosted journal publications. (It appears more common in other library publishing activities such as special "digital projects").

Some notable library-based journals that do support multimodal scholarship include *Southern Spaces*, the *Journal of e-Media Studies*, and *Tremor and Other Hyperkinetic Movements*. These publishers have adopted different approaches to integrating video into their online journal articles. The *Journal of e-Media Studies*, published by the Dartmouth College Library, utilizes a lower barrier approach by integrating embedded still images within the article that are linked to external hosted videos ("Journal of e-Media Studies," 2013). *Southern Spaces*, published by Emory University Libraries, includes both embedded playable streaming videos and linked still images to external videos within the article ("Southern Spaces," 2013). Finally, *Tremor and Other Hyperkinetic Movements*, published by the Center for Digital Research and Scholarship (CDRS) of Columbia University Libraries/Information Services, includes pop-up streaming videos embedded within the article ("Tremor and Other Hyperkinetic Movements," 2013). This latter example might suggest that expense and initial platform development support are potential significant barriers to greater adoption, as *Tremor and*

Other Hyperkinetic Movements required a dynamic video player component that was offered as part of CDRS' fee-based premier service package (Maughan, et al., 2011).

A challenge faced by all journal publishers (library-based or not) is identifying ideal opportunities for authors to most effectively incorporate media to (a) enhance the communication of their research and (b) best aid publishers in promoting their publications. As this paper will discuss, adoption of the video abstract genre holds promise to serve as a relatively low barrier model to accomplish both of these goals.

Video abstracts defined

The video abstract genre has great potential benefits across all disciplines and in multiple publishing contexts, beyond journals. However, this paper focuses on the particular use of the video abstract within the science academic journal context, as there are few examples in arts, humanities, and social sciences journals (Berkowitz, 2013). Video abstracts are defined here as: *a video presentation corresponding to a specific science research article, which typically communicates the background of a study, methods used, study results and potential implications through the use of images, audio, video clips, and text*. Other genres of digital video that describe scientific research, such as supplemental experiment procedures and video data sets, conference presentations, popular videos, editorials, interviews not relating to a specific article, instructional, and journal promotional videos, are not considered here. Though a traditional abstract serves a similar purpose of providing an article summary, the video abstract affords authors an opportunity to briefly communicate their research through a more personal, media rich medium that is better adapted for Internet sharing. The *Journal of Visualized Experiments* (JoVE), launched in 2007, provides one of the earliest examples of the digital video abstract. JoVE embeds a professionally produced video alongside each traditional full text article, documenting the experimental method used in the study and including a video interview with the author describing the research study of the article.

Video abstracts: Exploring current practice

While JoVE's videos are only available on its website to paid journal subscribers, other journals provide full access to video abstracts either on their own websites or through YouTube as a way to increase the visibility of their authors' work. This paper will provide a snapshot of the increasing use of such video abstracts by science journals, and will then provide a case study of one such journal—*New Journal of Physics*—in order to specifically address the following research questions:

1. Given that YouTube is a mass communication platform aimed at a general audience and an online journal is focused on scholars, will the usage (views) of a video abstract remain consistent across both YouTube and a journal's native video streaming platform?

2. Is there a significant relationship between the usage of an article (views/downloads) and corresponding video abstract (views)?

It is hoped that addressing these questions through an examination of the *New Journal of Physics* will lead library publishers to further examine (a) whether hosting video abstracts on their own websites or on YouTube (or both) is preferable and (b) whether the presence of a video abstract has the potential to increase the impact of a scholarly article.

LITERATURE REVIEW

Video abstracts: Purpose and context

Though video abstracts have existed since at least 2007, there has yet to be a systematic study of the genre, with most of the discussion of this practice coming from journal editors and authors. Science journalist Jacob Berkowitz captures this dialogue in a recent popular article (2013). From an editor's point of view, John Kuemmerle suggests that given competition amongst authors and journals for high impact and article citations, video abstracts can be a useful marketing tool for reaching potential readership and video viewers to learn more about the publication itself (as cited in Berkowitz, 2013). Tim Smith, editor of the online journal *New Journal of Physics* (NJP), provides an example of this marketing benefit, suggesting that video abstract posts from that journal's YouTube channel helped raise the visibility of the corresponding full text article hosted on the journal's website (Berkowitz, 2013).

For the author, the video abstract provides an opportunity to use the visual and audio affordances of the medium

to communicate complex information. For example, Barry Sanders, an author who produced a video abstract for his NJP article, cites the development of scientific visualization in quantum physics as a motivation to suggest that NJP begin offering the video abstract option to its authors (Berkowitz, 2013). Another major benefit of creating video abstracts suggested by authors is that the very process of having to produce a video can be useful in understanding their research in new ways. For example, Paul Young, an author who produced two video abstracts for articles in the *Journal of Number Theory*, describes his decision to produce simple videos of him explaining his research in front of a camera with a lake in the background, as a challenge to communicate his work through different modes (Berkowitz, 2013).

The emergence of video abstracts is occurring within a broader evolving digital publishing landscape that includes the multimodal scholarship and alternative metrics ("altmetrics") movements. For example, outside of the sciences, the multimodal humanities journal, *Vectors*, only accepts works that could not be published in a print format (McPherson, 2010). Echoing the sentiments of Sanders and Young, Tara McPherson, editor of *Vectors*, highlights the value of multimodal scholarship to offer researchers and their audiences additional ways to understand and engage with the subject matter from different perspectives (2009). McPherson (2010) also suggested that there is a need for "more "standardized" structures and interfaces that allow us to delineate more stable genres and to scale multimodal scholarship" (Moving to Scale section, para. 2). Video abstracts, which are often created following specific guidelines provided by a journal, seem to provide an example of this type of "standardized" multimodal scholarship that McPherson describes.

"Altmetrics" and the impact of video abstracts

Traditional metrics for measuring scholarly impact are inadequate for evaluating and crediting scholar producers of non-traditional forms of scholarly communication, such as video abstracts. In response to this (and other issues with citation metrics), there has been a movement to develop alternative metrics ("almetrics"), defined as "new metrics based on the Social Web for analyzing, and informing scholarship" (Priem, et al., 2010). For example, Piwowar (2013) has suggested that view counts or Facebook "likes" for a scholar's YouTube video can be captured to demonstrate impact. In addition, tools such as the Firefox Almetrics Bookmarklet offer the ability to capture where a video abstract has been referenced on blogs and popular websites, which is useful for articulating outreach impact.

Though there has yet to be a study exploring the validity of impact measures of YouTube-hosted video abstracts, Thelwall, Kousha, Weller, & Puschmann (2012) conducted a study exploring the audiences and use of view counts as an impact measure for various genres of scholar produced YouTube videos, as cited by tweets from scientists. Thelwall et al. (2012) are critical of whether video view counts should be used as a sole/primary measure scholarly impact, given that most academic videos have a small specialized audience and low view count, which they posit could be easily manipulated (p.207). They also suggest that even a high view count could be attributed to reasons other than scholarly contribution, such as a viral effect or entertainment value (p. 207). However, Thelwall et al. (2012), acknowledge that view counts could be considered as a component of overall impact when "videos could be regarded as supporting other scientific activities that might have measurable outputs" (p. 207). In other words, when a video is provided as a supplement to a traditional form of a scholarship (e.g. a journal article), the view counts for that video could be considered together with citations and other metrics for the article itself to create a complete picture of the work's impact. This description of video abstracts as supplementary works is consistent with the video abstract use case presented in this study.

Considerations for publishers

An important consideration for publishers who may be exploring the use of video abstracts is whether such abstracts should be locally hosted by the publisher or distributed through a general video sharing platform such as YouTube (or both). However, there is currently a gap in the literature describing how much attention video abstracts receive when published across different video distribution platforms. This question is important when considering the most effective strategies for reaching audiences that may be interested in the research presented in an article. Further, there is a gap in the literature exploring the potential usage relationship

between a video abstract and corresponding journal article; in other words, does the presence of a video abstract increase the use or impact of its corresponding article? Understanding these issues better will provide valuable insights to academic libraries that currently offer academic journal publication services, or that may wish to consider potential expansion of other library services to better support these emerging practices.

CURRENT TRENDS IN VIDEO ABSTRACTS

Video abstract publication trends

Though science video abstracts have existed for at least six years, there are currently no industry figures on the historic publication trends of this genre (Berkowitz, 2013), nor has there been any apparent systematic research published documenting its development. Therefore, in order to provide context for the case study presented in this paper, a snapshot of journal video abstract activity was captured through analysis of a large sample of journal-sponsored YouTube channels (only journals with YouTube channels were included in order to provide a consistent source of comparative data). Data examined covered general publication activity, including journal video abstract publication participation, frequency of video abstracts published, and video abstract usage (views). Journal video abstracts were initially identified primarily through keyword searches of journal title and publisher names that were linked to video abstracts discovered through the advanced search engine on *ScienceDirect*, which allows users to limit results to the video format.[1] Additional collections of video abstracts were discovered within YouTube using key terms such as "video abstracts" and "journal abstracts." This data set was further limited to journals that had at least five video abstracts published to their YouTube channel. Therefore, this sample data set does not represent all video abstracts that have been published, as several journals published just a single video abstract to their YouTube channel or in some cases, individual authors published video abstracts to their personal YouTube accounts outside of the formal journal environment.

20 journals from six different publishers were identified (Table 1, following page). The disciplinary break down included 10 journals from medicine, six from biology, two from chemistry, and one each from math and physics.

The publication date range covered five years, with the earliest video abstract published by the *Journal of Number Theory* on May 15, 2008 and the most recent captured in this study published by *Biotechnology & Bioengineering* on May 28, 2013. The video abstract publication frequency demonstrated consistent positive growth over the past five years, with the most significant gains realized in 2012 with 358 (Figure 1, p. 7). Data for 2013 is partial, as it includes publication frequency statistics for less than half of the year.

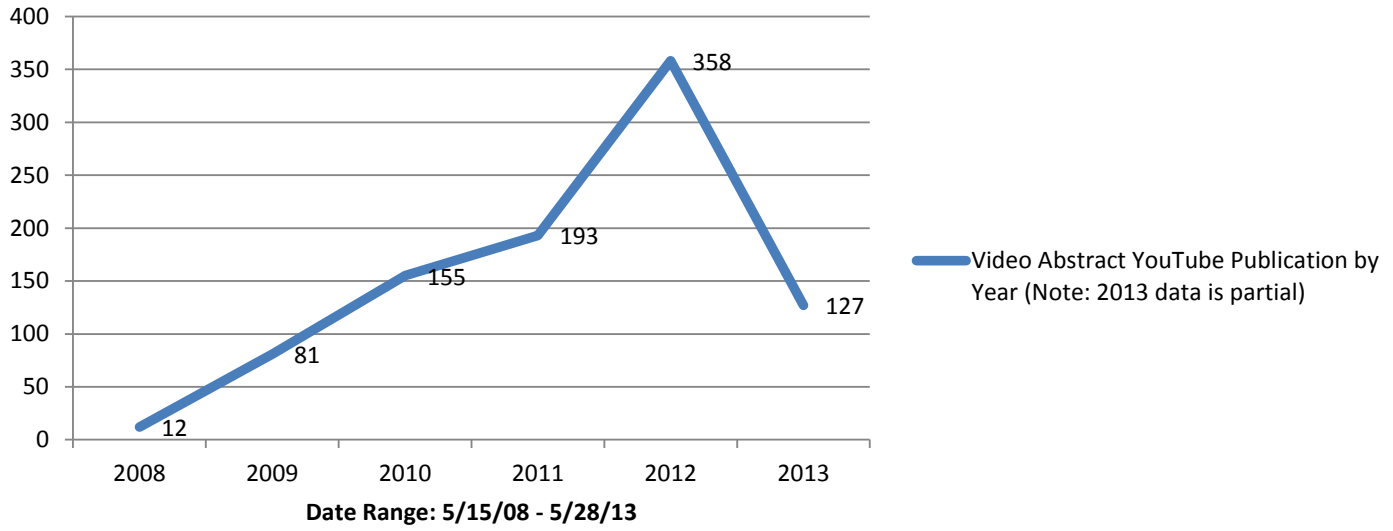
The top four journals (*New Journal of Physics*, *Clinical Gastroenterology and Hepatology*, *Gastroenterology*, and *Cell*) accounted for nearly 48% of the total number of video abstracts published, while the top half (10 journals) equaled nearly 86% of the overall total (Table 1, above). In terms of total view count and videos published, YouTube reported a total of 865,995 views for the 926 video abstracts identified. The journal *Cell* had the largest average view count per a video abstract at 2,947 views. The journals *Current Biology* (2,500 views), *Journal of Number Theory* (1,519 views), and *Gastroenterology* (1,046 views) rounded out the top four average video abstract view counts (Table 1, following page). It should be noted that the analysis of video publication view count described here is designed to be descriptive, not comparative, to illustrate historical video abstract publishing trends. Several factors, such as the size of the readership for a given publication, likely plays a significant role in the total number of views a video abstract receives.

[1] Due to an initial YouTube reporting error, an approximate view count was retroactively captured from the YouTube Statistics June timeline for a single video abstract from the *International Journal of Nanomedicine*, *International Journal of General Medicine* and *Human Mutation*. All data for the video abstract publication trends data set was gathered June 6, 2013 except for the J*ournal of Physical Chemistry Letters* and *Environment Science and Technology*, collected August 23, 2013 when the author learned that these publications also included video abstracts. The date range of the video abstracts included in this set fell was limited to the range of the rest of the data (December 23, 2010–May 14, 2013). The view counts for these additions were taken from August, as only a rough estimate was available from the YouTube Statistics timeline for the June 6, 2013 date when the rest of the data set was captured. This delayed capture had a negligible impact on the overall data analysis for the general purposes of documenting historical video abstract journal participation, publication frequency, and view count. See data set file (Spicer, 2014) for further details.

Table 1. Video abstract publication journals, date range, YouTube totals, percentage of total published, YouTube view counts and average view count per video abstract

Journal Title	YouTube Publication Date Range	Number of YouTube Video Abstracts	% of Total Video Abstracts Published	Total Video Abstracts View Count	Avg. View Count per Video Abstract
New Journal of Physics (Institute of Physics)	10/15/2011 - 5/24/2013	131	14.15%	21366	163
Clinical Gastroenterology and Hepatology (Elsevier)	4/16/2009 - 5/22/2013	111	11.99%	87224	786
Gastroenterology (Elsevier)	4/16/2009 - 5/22/2013	104	11.23%	108736	1046
Cell (Cell)	5/21/2009 - 5/10/2013	95	10.26%	279993	2947
Journal of Number Theory (Elsevier)	5/15/2008 - 5/2/2013	83	8.96%	126045	1519
Neuron (Cell)	1/27/2010 - 5/8/2013	81	8.75%	53938	666
Journal of Physical Chemistry Letters (American Chemical Society)	4/22/2010 - 5/14/2013	70	7.56%	61181	874
Developmental Cell (Cell)	10/27/2011 - 9/27/2012	49	5.29%	10107	206
Biotechnology & Bioengineering (Wiley)	9/1/2011 - 5/28/2013	44	4.75%	14534	330
Current Biology (Cell)	4/16/2010 - 4/18/2013	28	3.02%	70005	2500
Clinical Ophthalmology (Dove Press)	8/7/2011 - 4/18/2013	25	2.70%	7151	286
Human Mutation (Wiley)	11/18/2011 - 5/16/2013	25	2.70%	5781	231
International Journal of Nanomedicine (Dove Press)	5/9/2011 - 4/23/2013	23	2.48%	6543	284
International Journal of General Medicine (Dove Press)	8/17/2011 - 5/28/2013	13	1.40%	3106	239
European Journal of Neuroscience (Wiley)	3/27/2012 - 5/13/2013	12	1.30%	3571	298
Environment Science and Technology (American Chemical Society)	12/23/2010 - 1/31/2013	8	0.86%	1992	249
International Journal of Women's Health (Dove Press)	9/29/2011 - 4/21/2013	7	0.76%	1779	254
Neuropsychiatric Disease and Treatment (Dove Press)	12/20/2011 - 4/4/2013	7	0.76%	1512	216
Drug Design, Development and Therapy (Dove Press)	11/21/2012 - 4/18/2013	5	0.54%	545	109
Patient Preference and Adherence (Dove Press)	7/6/2011 - 1/23/2012	5	0.54%	886	177
Total Video Abstracts (at least 5)		**926**	**100.00%**	**865995**	**935**

Figure 1. Video abstract YouTube publication frequency (by year to date)



Video abstract guidelines trends

Video abstract guidelines are used by most publishers to help establish appropriate video standards for a given publication and discipline area and to provide video production tips, which is especially useful for authors who may not be media savvy. This is particularly important because, in contrast to the professionally produced *Journal of Visualized Experiments* video abstracts, all 20 journals examined here require their authors to produce their own videos. Video abstract submission guidelines are posted on 15 of the 20 journal websites.[2] Suggested guidelines vary across several core areas including technical quality specifications, editorial review process, copyright considerations, English language requirements, use of content types, compositional structure, and tone.

Some areas of the suggested guidelines are applicable across publications and disciplines such as technical standards (e.g., video frame rates (H.264, Mpeg4, .MOV, .AVI), video frame rates (15-30 fps) and audio bitrates (70-128 kbps)); copyright statements on the need for authors to own the rights or obtained permissions for all media incorporated into their videos; that an editorial review and approval prior to publication would be necessary; and a requirement that videos be created in English (or perhaps an identical second video produced if English is not the author's first language).

Certain guidelines relating to the use of content types, compositional structure, and tone are usually publication or discipline specific. For example, the *Journal of Number Theory* is the only journal that suggests a more informal tone, with a statement that, "we do not want these abstracts to be polished video productions rather we view them as informal video productions much like teleconferencing" ("Journal of Number Theory Guidelines," 2013). This tone can be observed in the previously cited Paul Young video abstracts, where the mathematician is seen describing his research in front of a lake (Young, 2011; 2012). This tone is also evident in several other *Journal of Number Theory* video abstracts, where mathematicians recorded themselves using a cell phone or consumer level camera explaining their research theorems on a white board. In contrast, suggested guidelines for video abstract content and compositional structure in the journal *Clinical Gastroenterology and Hepatology* (and also *Gastrenterology*) are appropriate for research in the biomedical sciences. For example, the guidelines suggest that video abstract discussion points include, "the motivation for undertaking the study, a brief overview of methodology, and the highlights of how the results advance the field of digestive disease," with further suggestion that authors, "show their laboratories and techniques or procedures related to their study"

[2] For a chart of detailed publisher practices see the "VA Publisher Guidelines" tab on the data set file (Spicer, 2014).

("Clinical Gastroenterology and Hepatology Guidelines," 2013). Finally, several of the journal guidelines also make recommendations to insure that images and text are visually clear and used effectively, and appropriate for the discipline area. For example, *Cell* encourages authors to, "**use schematics** [emphasis *Cell*], and minimize the use of raw data and figure panels, to communicate your findings clearly" ("Cell Guidelines," 2013).

CASE STUDY: NEW JOURNAL OF PHYSICS

In order to address the specific research questions posed in the introduction, the *New Journal of Physics* (NJP) was selected for closer examination and analysis. NJP was selected for this study because the journal was an early adopter and continues to be a strong promoter of author-produced video abstracts, evidenced by the significant number published to date (number one of all 20 journals in the earlier sample). NJP was also selected because it collects a wide range of article level usage statistics that are made publicly accessible.

METHODS

Relationship between YouTube and native platform video abstract usage (views)

Given that video abstracts are often hosted on YouTube (a mass communications social media platform), and also hosted separately on a streaming service connected to the journal's website (a researcher audience), this study sought to better understand if there was a significant correlation of usage between the two platforms. In other words, if a video has a high view count on one platform, will it be more likely to have a high view count on the other as well (or will a high view count on one platform correspond to a lower view count on the other)?

Video abstracts published on the native NJP platform are accessible either through an embedded video player within the corresponding article full text webpage, on a separate stand-alone video abstracts page listing all NJP video abstracts, or embedded in webpages and social media outlets across the Internet. It should be noted that video view counts on the native platform are aggregated regardless of user access point. Therefore, for the purposes of this study, the comparison study is between YouTube and the journal's native video abstract hosting platform (called Brightcove), and is not necessarily limited to the view count from a video abstract embedded on its corresponding full text article webpage. The Outwit Hub Firefox data extraction tool was used to capture NJP hosted video abstract data for titles, publication dates, and view counts (gathered March 27-March 29, 2013). This data was subsequently exported to Excel for analysis.

The initial data set totaled 112 video abstracts, and included coverage from March 1, 2010 (the publication month of the first NJP article to include a video abstract) to December 31, 2012. Because many of the NJP articles with video abstracts had a publication date that was several months earlier than the corresponding YouTube publication date, this data set was further refined to 56 titles where both the NJP article and YouTube publication dates were within 30 days. This decision was made to reduce the potential effect of publication delay on view count usage in subsequent analysis. YouTube and NJP native streaming video abstract view counts were then correlated to determine if the pair of identical video abstracts on both platforms received similar levels of usage. Because the view count data was heavily skewed in favor of a few video abstracts, the nonparametric, Spearman rank correlation coefficient test was chosen, with the test being run using the SPSS statistical software (version 21). Spearman measures the strength of a monotonic relationship (i.e., as one variable increases so does the other, or as one value increases the other decreases) and direction of association between paired data. In addition, a simple analysis comparing the percentage of total views on both the journal hosted website and YouTube (as a percentage of the total number of views for the data set of 56 articles) was conducted to explore audience viewing usage by platform.

Relationship between video abstract viewership and article usage/popularity

This study also sought to determine whether there was a significant relationship between the video view usage of video abstracts on the YouTube and NJP native streaming platforms, compared with the readership usage and relative popularity of their corresponding articles.

Article usage data, defined by the publisher as HTML views + .PDF download counts ("Article level metrics,"

n.d.), was also captured during the video abstract data collection process previously described. To determine whether there was a significant relationship between video and article usage, separate Spearman rank correlation coefficient tests were run on the identical data set of 56 video abstracts. These tests correlated the respective YouTube and NJP hosted video view counts directly with corresponding article usage.

In addition, an analysis of both the top 25 and 100 read articles were evaluated for video abstract presence to determine whether a journal's most popular titles were more likely to have a video abstract present. The top 25 and 100 articles were identified from usage data that included all 2,357 articles published in NJP between March 1, 2010 and December 31, 2012. The full data set of 112 video abstracts, that covered the same date range, was then reconciled with the top 25 and 100 lists to determine the overall percentage of popular articles with a video abstract present.

RESULTS

The Spearman rank correlation coefficient test found that there was a moderate, positive monotonic correlation between the video abstract view counts on NJP's YouTube channel and the native streaming platform on the journal's website (r_s = . 56, n = 56, p < .001), a strong, positive monotonic correlation between the video abstract view counts on the NJP native streaming platform and the readership usage of the corresponding article (r_s = .76, n = 56, p <.001), and a moderate, positive monotonic correlation between the YouTube video abstract view count and article readership usage (r_s = .49, n = 56, p < .001). There were 60,191 total video views combined between the YouTube and NJP native streaming platform for the 56 video abstracts studied. The majority of the view count (86%) came from the NJP native streaming platform (51,476 total views) while 14% came from the journal's YouTube channel (8,715 total views).

The 112 video abstracts published between March 1, 2010-December 31, 2012 comprised just fewer than 5% of the total number of articles (2,357 total articles) published in NJP during that time period. Of the top 100 articles (of the 2,357) with the highest usage, 18% had a video abstract associated. Of the top 25 articles with the highest usage, 36% had a corresponding video abstract.

DISCUSSION

The first research question of this study explored the role of video distribution platforms and video usage through the NJP use case by using a Spearman rank correlation coefficient test to correlate the video view counts of the journal's YouTube channel and the native streaming platform on its website. A second research question studied the relationship between video viewership and article access, by running a Spearman test to correlate video view counts on both the NJP and YouTube platforms with article usage.

Viewership across platforms

The finding of a moderate, positive correlation of video viewership across both platforms provides some evidence that viewer usage of a video abstract is relatively similar, proportionately, across both the journal hosted and YouTube platforms (i.e., videos that receive higher or lower view counts on one platform were moderately likely to receive similar higher or lower view counts on the other). Given that YouTube is a mass communications platform, as opposed to a journal's online web presence, which is geared towards scholars, it was not assumed that there would necessarily be a significant correlation between the two platforms. Unfortunately, it was not possible with the data provided to determine precisely the demographics of video viewers on each platform, but given that the majority of *total* views came from the NJP platform (86%), it is likely that scientists (and perhaps, students) were the vast majority of consumers of this material. This is also supported by evidence that at least some of the video abstracts from both platforms were embedded elsewhere on science research blogs, which was discovered through the use of the Firefox Altmetric Bookmarklet tool. Furthermore, considering the specialization and niche nature of much scientific research, it follows that scholars would be the primary audience for this content, regardless of the platform on which it appears. To illustrate, the most viewed YouTube NJP video abstract in the 56 article sample data set was "Graphene, universality of the quantum Hall effect and redefinition of the SI system," which described a physics related experiment to test the validity of a change in the way mass and electrical current are measured (Janssen, et al., 2011). This particular experiment may be of greatest interest to

scientists in solid-state physics, a field that, according to the video abstract, has studied the presence of the quantum Hall effect in materials.

Given these results, though total viewership was not as high as through the NJP native platform, YouTube should be considered an additional viable channel for reaching an audience that may not have been aware of an article's existence. This is especially true considering the negligible investment in time and cost to repost a video on YouTube (which, in the case of NJP, then resulted in 14% of total video abstract views (8,715 out of a total 51,476 views)).

Article and video abstract usage

Articles that had a higher reader count tended to also have a higher video abstract viewer count. This was particularly apparent in the strong, positive correlation between the NJP hosted video view counts and article usage. While the author of this paper was unable to confirm this with the NJP publisher, it seems probable that because the embedded video on the full text article page was likely the primary access point for most NJP hosted video abstracts, a larger readership base for a full text article would naturally provide a larger potential video viewership base as well. However, it should be noted that individuals can access the NJP-hosted video via the stand-alone video abstracts gallery page on the journal's website or when the video is embedded on websites elsewhere on the Internet. Unfortunately, the view count for the NJP-hosted video on all three platforms is aggregated in the single displayed view count total so it is impossible to know for certain how much of the view count may have come from sources outside of the embedded video on the full text article page. Having data available delineating the separate break down of view counts from these three access points would be useful in better understanding user access preferences, and would allow for directional assumptions about the relationship between article use and video views (e.g that initial video views through the abstract gallery or through an embedded video led to article usage—as opposed to article usage leading to video views on the full text article page) As it stands, the data suggests a relationship between article use and video views, but does not allow for conclusions about directionality/ order of use.

Another limitation of this study is that the available data did not make it possible to verify Tim Smith's suggestion that posting video abstracts to YouTube is useful for raising the visibility of its corresponding article. To help better understand this relationship, it might be useful to analyze server log referral data from YouTube in a future study. However, given NJP's prolific publishing of video abstracts, with 131 total as of May 2013 (number one rank of all 20 journals examined in the contextual snapshot of abstract activity), and best practice of including a direct URL in the YouTube description to the full text article, this is a strong possibility. Further, though not as strong as the NJP-hosted video view count and article correlation, the finding of a moderate, positive correlation between the YouTube view count and readership of its corresponding article might suggest that videos on YouTube are to some extent proportionally popular to their corresponding articles (and, as readers who arrived at the article on the NJP site first would be more likely to view the native video embedded there, it seems probable that YouTube views direct viewers to read the article, whereas that directionality is less clear with the natively-hosted videos). As Thelwall et al. suggested (2012, p. 207), given the number of variables that determine the popularity of a science YouTube video, it is difficult to determine precisely what aspects of a given video (e.g., study topic, study results, (viral) video content) might have contributed to this relationship, other than to assume that an article and abstract will generate similar interest/views based on their shared content.

Finally, one of the surprising findings of this study was that while video abstract enhanced articles accounted for less than 5% of all NJP articles published (covering March 1, 2010-December 31, 2012) which corresponds to 112 articles out of 2,357 total articles, such articles represented 18% of the most popular 100 articles and 36% of the top 25 articles. This is not to suggest that having a video abstract alone will necessarily make an article more popular, as there are many variables that contribute to an article's usage. (For example, this finding could just as easily suggest that authors of studies addressing particularly significant (or popular) topics are more likely to create a video abstract).

CONCLUSION

As a mechanism for communicating research, video abstracts have potential applications for journals in

any discipline. While this paper explored the use of video abstracts within the science scholarship, this was primarily due to the early adoption of video abstracts in fields such as medicine, biology, chemistry, math, and physics. As authors have suggested (Berkowitz, 2013), one of the greatest arguments in favor of video abstracts is that they provide an amazing opportunity to communicate complex information in aurally and visually stimulating ways that would otherwise be impossible to communicate through print alone. By leveraging the multimodal nature of video, the creators of video abstracts (and other types of multimodal scholarship) have also described the benefits of understanding their work through a different perspective (Berkowitz, 2013). This shared media literacy connects the authors of science video abstracts to the motivations of scholars in other disciplines engaged in various forms of multimodal scholarship.

Though the 926 videos, 20 journals (six distinct publishers), and roughly 866,000 YouTube views identified in this paper over the past five years may suggest that video abstract publication trends are still relatively young, it is also clear that this form of scholarship has experienced consistent annual growth and will likely continue to do so in the future. Indeed, the emergence of the video abstract genre offers a low-barrier opportunity for researchers to leverage the video medium to communicate their research more effectively; for library-based journal publishers to enhance the visibility and audiovisual capability of their articles and publications; and for librarians in other library service support roles (e.g., subject and media librarians) to expand services to aid in the creation of such videos as an initial step in supporting multimodal scholarship by researchers in their communities.

Future directions: Practice

The case study presented in this paper demonstrates that the viewership of a video abstract tends to remain relatively proportionate across both YouTube and native journal streaming platforms (and to a lesser extent, in relation to the popularity of its corresponding article). Therefore, authors and publishers should consider leveraging multiple platforms to share these videos as a means of reaching the widest possible audience. In conjunction with supporting the use of video abstracts, publishers should consider providing altmetrics as a way of measuring the scholarly impact of both these nontraditional works and their associated articles. Tracking altmetrics can provide a broader picture of the impact of an article and its corresponding video abstract by capturing the video view counts along with the journal impact factor, number of citations, and article downloads, and by using the Firefox Altmetric Bookmarklet (or other altmetric tools) to identify where articles or videos have been referenced elsewhere on the Internet, which can further indicate the influence of the author's work.

Recommendations for library publishers

As many library digital publishing programs have already done ("Library Publishing Directory," 2013), those responsible for supporting journal publishing should consider adopting platform technologies such as Hydra, Digital Commons, and the @mire module (used with DSpace), that support media and the dynamic embedding of video and other media types with text.

Library-based journal publishers should also consider the possibility of offering their authors an option for submitting video abstracts, and help journals in their publishing portfolio to develop appropriate journal- and discipline-specific video abstract guidelines. These guidelines can set quality standards and define the journal's video abstract review process, while also providing authors with tips for technical production and composition and a better understanding of the benefits of creating video abstracts. While this paper focused on video abstracts in journals, libraries could also consider the possibility of adopting video abstracts for use in other scholarly publishing contexts, such as dissertations, masters theses, undergraduate honors projects, as supplements to posted conference presentations, or perhaps as a means of offering a brief overview of a library sponsored digital project or online collection.

Outside of library-based publishing programs, subject librarians should also consider learning more about the emerging practices of multimodal scholarship in their fields in order to provide their faculty members with information on the benefits of these genres and mediums, as well as to identify potential venues for publication that support multimodal scholarship.

Further, librarians should be able to educate faculty and researchers about how best to demonstrate the impact of their work (whether traditional articles or multimodal scholarship) through the use of altmetrics (e.g. by encouraging faculty to explore using ImpactStory or figshare).

Finally, a growing number of academic libraries now provide campus media production support services, often as part of their learning commons or media services program portfolios. Academic media librarians and other library media professionals should consider marketing their services to faculty members interested in producing video abstracts or other multimodal scholarship—as well as exploring opportunities for partnerships between library publishers and media services.

Future directions: Research

This paper is intended to serve as an exploratory investigation into the publishing practices of video abstracts through a science scholarship context, as a means of suggesting possible implications for library publishers and other library support services.

As an emerging genre, there are a number of potential ways in which to expand upon the findings presented in this paper. Given that the NJP case study was a single sample, it would be useful for future studies to further explore the relationship between viewership of video abstracts hosted on YouTube and native journal streaming services, in addition to exploring relationships between video abstracts and article readership. Additional potential areas for research include: a deeper study with abstract users/viewers on the specific contexts in which video abstracts were used (e.g., personal scholarly use, instructional use, etc.); feedback from video abstract viewers on the unique benefits these works offer in enhancing understanding of an article's research; additional use cases from video abstract creators describing how this genre has enhanced their communication and personal understanding of their research; and feedback on the ways in which altmetrics have been used to demonstrate the impact of these works. It would also be useful to conduct a deep content analysis on a large sample of video abstracts to better understand their use of content types, compositional structure, tone, and how they reflect the corresponding guidelines of their journals. Finally, it would be useful to explore the strategies and rationale of library publishers and other library service areas that have adopted advanced support for video abstracts (and multimodal scholarship in general) in order to share experiences and develop best practices as demand for these services grow. Insights from these further areas of research will help scholars and those responsible for supporting them better leverage the vast potential of this emerging form of scholarly communication.

ACKNOWLEDGEMENTS

The author would like to acknowledge the contributions of Carolyn Rauber for support on the study and Jan Fransen for technical support on the data analysis methods.

REFERENCES

Article level metrics (n.d.). In *New Journal of Physics*. Retrieved from http://iopscience.iop.org/info/page/article-level-metrics

Berkowitz, J. (2013, February 6). Video abstracts, the latest trend in scientific publishing: Will "publish or perish" soon include "video or vanish"? University Affairs. Retrieved from http://www.universityaffairs.ca/video-abstracts-the-latest-trend-in-scientific-publishing.aspx

Cell Guidelines. (2013). Retrieved December 20, 2013, from http://www.cell.com/video_guidelines

Clinical Gastroenterology and Hepatology Guidelines. (2013). Retrieved December 20, 2013, from http://www.cghjournal.org/authorinfo

Janssen, T. J. B. M., Fletcher, N. E., Goebel, R., Williams, J. M., Tzalenchuk, A., Yakimova, R., Kubatkin, S., Lara-Avila S., & Falko, V. I. (2011, October 22). Graphene, universality of the quantum Hall effect and redefinition of the SI system. [Video file]. Retrieved from https://www.youtube.com/watch?v=sCb1m9CQxYM

Journal of e-Media Studies. (2013). Retrieved December 4, 2013, from http://journals.dartmouth.edu/cgi-bin/WebObjects/Journals.woa/xmlpage/4/issue

Journal of Number Theory Guidelines. (2013). Retrieved December 20, 2013, from http://www.elsevier.com/journals/journal-of-number-theory/0022-314X/guide-for-authors

Library Publishing Coalition. (2013). Library publishing directory. Retrieved from http://www.librarypublishing.org/sites/librarypublishing.org/files/documents/LPC_LPDirectory2014.pdf

Maughan Perry, A., Borchert, C. A., Deliyannides, T. S., Kosavic, A., & Kennison, R. (2011). Libraries as Journal Publishers. *Serials Review*, *37*(3), 196-204. http://dx.doi.org/10.1016/j.serrev.2011.06.006

McPherson, T. (2009). Introduction: Media Studies and the Digital Humanities. *Cinema Journal, 48*(2), 119-123. http://dx.doi.org/10.1353/cj.0.0077

McPherson, T. (2010). Scaling Vectors: Thoughts on the future of scholarly communication. *Journal of Electronic Publishing*, *13*(2). http://dx.doi.org/10.3998/3336451.0013.208

Piwowar, H. (2013). Altmetrics: Value all research products. *Nature*, *493*(7431), 159. http://dx.doi.org/10.1038/493159a

Priem, J., Taraborelli, D., Groth, P., & Neylon, C. (2010). altmetrics: about. Retrieved from http://altmetrics.org/about/

Southern Spaces. (2013). Retrieved December 4, 2013, from http://www.southernspaces.org/

Spicer, S. (2014). Exploring video abstracts in science journals [data file]. Minneapolis, MN: University of Minnesota Digital Conservancy. Retrieved from http://hdl.handle.net/11299/162683

Thelwall, M., Kousha, K., Weller, K., Puschmann, C. (2012). Assessing the impact of online academic videos. In: G.W. Wulff & K. Holmberg (Eds.). *Social information research* (195-213). Bingley, U.K.: Emerald Group Publishing Limited.

Tremor and Other Hyperkinetic Movements. (2013). Retrieved December 5, 2013 from http://www.tremorjournal.org/

Young, P. (2011, March 8). On p-adic multiple zeta and log gamma functions. Retrieved December 19, 2013, from https://www.youtube.com/watch?v=I9Bv_CycEd8

Young, P. (2012, June 6). Explicit computation of Gross-Stark units over real quadratic fields. Retrieved December 19, 2013, from https://www.youtube.com/watch?v=8h1-GW-sTNc

CORRESPONDING AUTHOR

Scott Spicer
Media Outreach and Learning Spaces Librarian

Walter Library
University of Minnesota-Twin Cities
117 Pleasant St SE
Minneapolis, MN 55455

spic0016@umn.edu