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Researcher and Academic Library Roles and User Beliefs in the Pandemic: designing the open-access and library usage scale (OALU)

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Abstract

We investigated whether individuals believe they have a right to information during a crisis, and whether attitudes about crisis-related information sharing differ by age and one's role in providing or consuming information. We measured attitudes about aspects of data sharing related to COVID-19: researchers' obligation to share data, publishers' obligation to share information, and libraries' responsibility to provide them. We predicted younger individuals, especially students as consumers of information, would report stronger preference for open access to pandemic-related information. A principal components analysis was performed, and two predicted factors emerged: information-sharing obligations and libraries' responsibility to provide resources. Age was not significantly correlated with attitudes about libraries or information-sharing. Planned analyses comparing students, faculty, and community members unaffiliated with the university revealed no differences in their attitudes regarding library resources or information-sharing. A lack of age and university affiliation-related differences can be explained by universally strong attitudes in favor of both information-sharing and library resources, with a greater desire for information-sharing. Knowing that individuals demonstrate a strong preference for open access to information and that these attitudes do not differ between those who are providing (faculty), and consuming information (students/community) can contribute to funding for these resources. This research is innovative and timely, as attitudes about access when information is urgently and globally needed, as during a pandemic, is likely to differ from those observed under different circumstances.

Introduction

Many individuals desire timely access to vast amounts of research-related information during a public health crisis. There are multiple dimensions to information access that can impact access to and usage of information without the added complications of a health crisis. Much angst and frustration has been mistakenly directed toward the scientists, researchers, or information providers when some of these issues can be attributed to other factors, like the lengthy peer-review process, access to high-speed internet or other digital divide barriers (Palayew et al. 2020, 666-669; Huisman and Smits 2017, 633-650; Vlasschaert, Topf, and Hiremath 2020, 418-426; Litchfield, Shukla, and Greenfield 2021). The digital divide is an invisible barrier affecting many aspects of information access and use. In the early days of the internet the digital divide focused on the haves and have-nots: people either had access to the internet via technology or they did not. Now we have a better understanding of the many nuances that influence information access, such as race, age, gender, sexual orientation, geographic location, socio-economic status, education, etc. In addition to the physical and socio-economic barriers of information access there are psychological ones as well, such as stress and anxiety, cognitive bias, self-efficacy, just to name a few.

Libraries are uniquely situated to address some of the factors influencing people's access to health crisis information, but they are also depended upon by citizens during such crises for more than just information access. Libraries not only break down physical or fiscal barriers to information, for example, by providing free access to newspapers, journals, magazines, books, and other resources, but they also address the psycho-social barriers by providing information literacy-focused classes, workshops, guides, and more. For example, libraries have long played a role in homeschooling, in fact about 80% of homeschoolers use a public library (Pannone 2019, 5-10), and during the Spring of 2020 when many schools and universities closed their campuses in favor of virtual learning, teachers, librarians, and other educators stepped up to the challenge. They shared their teaching and learning knowledge and expertise with not only their colleagues in the field but also with the parents and guardians at home who were now expected to homeschool their children (Walsh and Rana 2020, 237-245).

Literature Review

Information Access and the Digital Divide

Historically people were controlled through not only their lack of access to information but also their lack of literacy skills. Burgess and Knox (2019, 38) tell us that "information has long been seen as a key to power within human societies and throughout history, humans have made ethical arguments concerning the controlling access to this power". Those that controlled information access and information use had the power to control the people. This power dynamic shifted during the Enlightenment which helped to democratize information access, and in the Twenty-First Century the *Universal Declaration of Human Rights* declared information access as "the right of every human being" (Burgess and Knox 2019, 38). So essential is this right that some argue "access to information is a linchpin right that secures access to other rights" by ensuring information for all (Burgess and Knox 2019, 38). In addition to being a basic human right, having access to necessary information creates an informed citizen who can fully

participate in, and benefit from, social and political practices (Birkinshaw 2006, 177-218). In summary, “it is hard to imagine a collective society working for peace and development without the essential information to do so” (Burgess and Knox 2019, 117).

Despite the progress we’ve made since the Enlightenment there are many modern barriers to information access which are determined partially by the digital divide. Early ideas about the digital divide identified parts of the population as either having access to information via communication technology or those without access. The assumption being that if you had access to technology such as a telephone, computer, etc., you had the access as well as the ability to use information. Early reports focused on the technology component and classified people as either haves and have-nots. Either you had access to information via technology or you did not. Bertot (2003, 185-191) correctly identified this as problematic, stating several dimensions exist beyond access to technology, such as telecommunication (broadband), economy (infrastructure), information access (government transparency), and information literacy (ability to locate and ethically use information). The other issue with the have/have-nots definition of digital divide is it completely erases all the invisible barriers to information technology, such as socio-economic status, immigration status, speaking a minority or heritage language, gender norms, geographic location, and age. Each of these factors must be addressed and solutions found because the digital divide exacerbates compliance and recovery during a health crisis, which we explore in the next section.

Global Information Access Related to the COVID-19 Pandemic

As the COVID-19 pandemic progressed the cross-country differences in the information-seeking behavior became more transparent. Although exact preferences differed by age and across countries, a preference for unofficial, media-based sources of information over official sources of information emerged in many studies. For example, one study found that information-seeking behavior was different for older and younger generations in one Chinese province. Both age groups trusted official sources over commercial ones; however, younger generations utilized the internet and social media whereas older generations preferred television. The pandemic did not change this behavior; both age groups relied on the same sources of information before and during the pandemic. They also found that over time, less pandemic-related information was sought, and less time was spent on information seeking due to information fatigue and emotional burnout (Tang and Zou 2021, 79). Likewise, older adults in Brazil reported feeling well-informed via various resource outlets, like radio, TV, and word-of-mouth. Many older adults also reported using the popular messaging tool WhatsApp to not only send and receive messages, video, and audio but also to re-read messages, which was important due to information overload or fatigue (de Maio Nascimento 2020, 499-511).

A survey in Iran found that regardless of their age and other demographic information, Iran TV, the internet, and social media were rated the most appealing, trustworthy, and most-used information sources when compared to all other sources, including radio, health professionals, newspaper, and the library. However, as in the Chinese province studied by Tang and Zou (2021, 74-80), Iranian participants indicated the reliability of official sources over unofficial ones (Abdekhoda, Ranjbaran, and Sattari 2021, 1-10). This implies that individuals may prefer to obtain information through accessible and unofficial sources, even when they are aware that other sources may be more reliable.

Like studies in other countries, surveys in the United States showed similar preferences for media-based news sources over official sources. During the height of the pandemic Lund and Maurya (2021, 1-11) found that older adults in the United States, aged 65 and older, displayed a preference for “everyday-life information”, especially about the economy and November 2020 elections. This highlights the importance of clear information in plain language and a de-emphasis on COVID-19 information gathering in the United States. This is in direct contrast to other countries in which the residents of the same age demographic demonstrated “greater concern about COVID-19” (Lund & Maurya 2021, 8); however, this might reflect pandemic fatigue as found by Tang and Zou (2021, 74-80).

Importantly, these unofficial sources of information may be the greatest predictor of noncompliance with measures to reduce the spread of COVID-19. Nazione, Perrault, and Pace (2021, 23-31) found that rather than an inability to enact preventative measures, messaging regarding preventative measures was at fault for noncompliance. Early messaging focused on simply washing hands when Nazione et al. (2021) argue that “stronger precautions [. . .] should have been featured in public messaging” (p.29).

Minorities and Healthcare

The pandemic experience differs for ethnic and racial minorities and underserved populations across the globe. At the onset of the pandemic, medical and health professionals called on their governments to better serve these groups by consistently collecting and analyzing data on ethnic and racial minorities during times of crises, because “evidence published from past pandemics proves that ethnic minorities are disproportionately affected, and experience worse health outcomes compared to other groups” (Abuelgasim et al. 2020, 5).

This prediction held true. Native populations, especially the Navajo population in the United States were hit particularly hard by COVID-19 (Wang 2021; Parkhurst, Huyser, and Horse 2020; Soto and Hakim 2020). COVID-19 incidence was 3.5% greater in American Indians and Alaska Natives than non-Hispanic white individuals (Hatcher et al. 2020). Black and African American groups experienced worse health outcomes compared to white populations, with the proportion of Black and African American individuals as one of the strongest predictors of positive COVID-19 testing (DiMaggio et al. 2020, 7-13). Finally, the Hispanic population has also been disproportionately affected by COVID-19, with greater positivity rates, hospitalizations, and deaths due to COVID-19 than white non-Hispanic individuals (Gil et al. 2020, 1592-1595; Center for Disease Control and Prevention, last modified November 20, 2021; New York Department of Health, last updated May 13, 2020).

Some of these health disparities were caused by differences in access to health care, underlying health conditions, lack of social trust, and institutional/government relations (Wang 2021), but access to information, especially in minority-language speakers, also played a role. (Gil et al. 2020, 1592-1595)

Even before the pandemic language and internet access were two of the many barriers that minorities faced regarding public health information in the United States. For example, a 2020 study of Zika virus knowledge among Latinas in North Texas found that women from low-socioeconomic backgrounds had difficulty with English-only material that was hosted online. Half the households were found to only speak Spanish and half the mothers did not complete high school. To compound the issue, internet use is statistically lower among Hispanic women

at 67.5% whereas 92.7% non-Hispanic white women and 92.9% of non-Hispanic African American women use the internet (Ramisetty-Mikler and Boyce 2020).

Defining open-access and data sharing

Many scientists make a living off their unique discoveries and many argue that data sharing is prohibitive of advancement in their fields and careers. Some argue for the privatization of datasets because of not only the resources spent but the potential harm to science: if there are open datasets then scientists will utilize those without creating their own data “thereby ultimately harming the progress of science” (Burgess, Knox, and Hauptman 2019, 84). However, there are some that argue the more data sharing we have the better science we will get. When scientists use open-access datasets they are increasing the value and return on investment of that research. Open data also allows for aggregation of datasets which can lead to new discoveries. Open data can make the public trust science better by allowing other scientists to check for mistakes or fraud. Finally, some argue that taxpayer funded research and data should be made available to the public; many faculty are already on-board with government-funded data being made available open-access (Charbonneau and McGlone 2013, 23). The simple solution is to allow the scientists first access and rights to their dataset before sharing and afterward confirm they get credit for additional discoveries made with their data.

Data sharing is made possible in some public repositories, such as the Open Science Framework, whose mission is to ensure “a future scholarly community in which the process, content, and outcomes of research are openly accessible by default” (Center for Open Science). During a pandemic the procedures and guidelines for publishing and maintaining open-access datasets may seem untenable, but many groups, including the Data Access and Transparency Advocates Group, have championed the need for open-access data and reporting such as the COVIDiSTRESS Projects (Yamada et al. 2021; Lieberoth et al. 2021; Yamada et al. 2021; Blackburn, Vestergren, et al. 2022).

Researchers' Role

Researchers cognizant of the need for quality and relevant data answered the call quickly and efficiently by contributing to open-access datasets, such as the COVIDiSTRESS “Open science collaboration” (Yamada et al., 2021, p.3) which ran for a month during the pandemic, was translated into 47 different languages and dialects, and collected valuable data from 173,426 participants from 179 countries. This data is already helping governments, health officials, and other decision-makers create sound policies based on documented risk factors (Den Faglige Referencegruppe 2021).

While many recognize the importance of transparency (Yamada et al. March 16, 2021; Yamada et al. February 27, 2021), many researchers are constrained by funding and the tenure process to publish in specific journals and prior to data sharing. These pressures can reduce the ability of researchers to disseminate their findings in open access venues (Tennant 2016). A 2013 survey of Faculty beliefs about access to federally funded research demonstrated the majority believed government funded data should be open access (Charbonneau and McGlone 2013, 21-25).

Publishers' Role

Timeliness of COVID-related research was a barrier during the COVID-19 pandemic and the lengthy peer-review process was not beneficial in advancement toward a vaccine; therefore, many publishers relaxed standards and allowed researchers to publish their un-vetted research to the scientific community as a preprint. (Eisen et al. 2020) For example, 6,700 preprints were released within the first four months of 2020 alone (Brierley 2021). There are many benefits for researchers to choose to preprint beyond rapid dissemination of their discovery, such as establishing claim on their findings, increased views and citations, community feedback, and possible career advancement (PLOS accessed May 15, 2021).

There are also many repercussions of open-access datasets and preprints: “unfettered access to preliminary reports has proven to be a double-edged sword with widespread dissemination via social media and the press serving as dangerous substitutes for peer review” (Sattui et al. 2020, 659). A prime example is “the swift uptake and downfall” of Hydroxychloroquine as a COVID-19 preventative which must now be a touchstone reminder for academics and publishers on the benefits of peer review during a health crisis. (Sattui et al. 2020, 663)

Retractions and misconduct by scholarly journals may also damage the public’s trust in not only the peer review and publishing processes but also in scientific literature itself (Shuai et al. 2017, 2225-2236). One of the most memorable retractions we are seeing the repercussions of today, especially in the proliferation of the anti-vaxxer movement, is the 1998 study suggesting a combination of certain vaccines had side effects which could cause Autism (Khan, Gasparyan, and Gupta 2021, e126). The widespread media coverage of this article incited an anti-vaxxer furor which could not be stymied by a simple article retraction. In most cases the negative impact of retractions is most severe for the author(s) and does not affect the sponsoring institution, related papers or scholars, nor the research topic itself (Shuai et al. 2017). The good news is that trust in the peer review process can be reinstated, even during a global pandemic. Mistrust and skepticism can be mitigated by publishers enforcing reporting of statistical procedures, open access datasets, and ethical committee approvals. Most importantly, appropriate peer-reviewers are critical in reducing publication errors. A system that values and rewards reviewers would improve the quality of the review process, especially during a global pandemic.

Library Role

Across the world public institutions including libraries and museums have proudly shouldered the mantle of supporting information access for all during the pandemic by preserving, organizing, storing, promoting, and disseminating information. Italy is one such example: as Italy was one of the first countries after China to be severely impacted by COVID-19, the libraries were severely affected. Italy and its libraries were shut down for quarantine, but people at home still needed access to information and resources for work, school, entertainment, and news.

Libraries in Italy found the digital divide to be the biggest obstacle for providing information to the public during this time, specifically the country’s lack of infrastructure, lack of funding, copyright restrictions, insufficiently or inadequately trained staff, dismantled communication and networking between libraries, as well as a “lack of vision” (Tammaro 2020, 219). Despite these obstacles digital resources saw a large increase in access, staff innovated reference services by utilizing Skype, and one library even reached out to patrons via 16,000 telephone calls (Tammaro 2020).

In a similar effort, Nigerian academic libraries remained open and continued services to their patrons by utilizing interesting channels, or information and communications technology (ICT), like disseminating information via WhatsApp and other social media (Omeluzor, et. al. 2021). Omeluzor et al. (2021) recommend plans for future pandemic solutions that include the creation of a disaster preparedness team for crisis management, sustainable ICT solutions and tools, including trained personnel, and digital resource subscriptions for mobile users.

While these behind-the-scenes efforts are clear to researchers and librarians, the public fundamentally misunderstands the processes and resources necessary to preserve, organize, store, promote, and disseminate information. Not only have libraries filled the information needs of the public during a pandemic by acting as aggregators, communicators, and teachers as seen above, but many libraries provided tutorials, modules, programs, etc., that facilitated the understanding and use of information.

During the pandemic librarians around the world pivoted these endeavors to focus on health-related fake news, misinformation, and disinformation (Bangani, 2021; Poole, 2021). Some librarians even stepped up to combat COVID-19 on a global scale by vetting, indexing, and helping disseminate health resources utilized by “medical and health professionals, humanitarian organizations, researchers, and the public” (Peet 2021, 14). Aiyebelehin and Mesagan (2021, 62-75) found in a Nigerian library survey that librarians mitigated the infodemic by correcting misconceptions online, posting official information, and provisioning authentic COVID-19 guidelines. Indeed, “libraries are an important player against the fake news phenomenon” (Revez 2021)

Under normal circumstances, people expect to easily access vast amounts of information online, and there has been an increase in open-access resources in recent years. Libraries have responded to this deluge of COVID-19-related data and information by creating hub sites with relevant tags and filters to streamline searching and access (Swogger 2020, 101-104). In India the National Digital Library of India (NDLI), an open access digital platform, was still available and utilized by students and researchers when their schools, libraries, and college campuses were closed or had limited access (Srivastava & Babel, 2021).

Library patrons and researchers weren't the only demographic needing timely access to COVID-19 related information. Many libraries, schools, and museums sought advice from the REALM project, which created and distributed science-based information and best practices that aimed to reduce the risk of COVID-19 transmission to staff and visitors engaging in the delivery or use of museum, library, or archival services (Swogger 2020, 101-104).

Age differences in access, consumption, and reactions to information

Adults of different ages are affected by the pandemic differently due to their information access, consumption, and concerns. Younger adults consume and react to information differently than older adults (Varma 2020). There are differences in the way that different age groups interact with information in the face of peer pressure. For instance, Pasupathi found that compared to older women, younger women lack the self-confidence to openly disagree openly with others. Pasupathi also found that older adults conform less to peer pressure but are not completely resistant to changing their mind depending on if they think the information presented is correct or not (1999, 170-174).

Despite the fact that older adults are more likely to be impacted by COVID-19, studies have shown that younger adults are more anxious about COVID than older adults (Blackburn and Perez 2021; Lieberoth et al. 2021). This might have to do with their information consumption, or the way information is being targeted at them, including both real and misinformation through social media (Tang and Zou 2021, 74-80). Young people are more anxious about Covid-19 thus requiring and utilizing more Pandemic related information, thus supporting our predictions that young people would want more access (Varma et al. 2020).

This study

In this study, we have investigated whether individuals believe they have a right to timely research-related information during a crisis. More specifically, we investigated whether attitudes about data sharing related to a crisis, especially one that differentially impacts older and younger adults, was moderated by age and one's role as a provider or consumer of information. To test this, we measured attitudes about three aspects of data sharing: researchers' obligation to share data, publishers' obligation to share information, and libraries' responsibility to provide services and resources. We predicted that younger individuals, especially students as consumers of information, would report stronger beliefs that publishers, researchers, and libraries have an obligation to provide open access to pandemic-related information.

Because no existing survey of this nature was known to us, we developed a survey to measure these constructs and tested its reliability. Thus our goals were two-fold: develop a survey to measure attitudes about open access and library usage, then use this survey to investigate beliefs across community members of different ages and affiliations with the local university. In particular, we used this survey to investigate whether individuals believe they have a right to information during a crisis and whether attitudes about crisis-related information sharing differ by age and one's role in providing or consuming information.

METHODS

Data Collection

A 13-item survey was administered to Texas A&M International University and the surrounding community with questions about researcher (5 items), publisher (3 items), and library obligations (5 items) to share information. Responses were anchored to a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). The full version is available in the Supplementary Materials.

This survey was administered as part of a longitudinal study about the impact of COVID-19 on the Laredo population. Participants in the longitudinal study consented to receiving regular weekly to monthly emails with links to online surveys measuring a variety of topics related to the COVID-19 pandemic (e.g., life satisfaction, social networks, relationships) and could choose to participate or ignore any surveys in the series. Participants were recruited for the longitudinal study through an email to the university and through social media efforts in the local community. These efforts included word of mouth snowball recruiting in which members of the community were asked to post the announcement on social media sites, including Facebook posts to local

community pages. Approximately 700 participants had begun the longitudinal study at the time of this survey administration.

The survey was administered online on October 11, 2020, along with other surveys about activities the participants had done that week, e.g., “Ordering pizza delivery,” and the PERMA Happiness Scale that measured their general happiness levels. The participants were informed that they were receiving multiple surveys and each survey was administered on a separate page with a title explaining that it each was a different survey. The response rate for this survey was similar to that of other surveys in the series. IRB ethics approval was obtained prior to investigation, and informed consent was obtained from all participants.

Participants

Seventy participants (ages 19-82; $M = 40.1$; $SD = 16.6$) were recruited from the Laredo area, both through the local university and through social media posts targeted at the surrounding community. This study was conducted in South Texas and included a diverse sample representative of the region with 40% Hispanic, 57% White and .03% Asian, Black or African American ($M = 15$, $F = 55$). Participants were grouped according to their affiliation with the university as students ($n = 21$), faculty ($n = 25$), and individuals unaffiliated with the university ($n = 24$).

We determined that our study had sufficient statistical power with this sample. While larger sample sizes are sometimes thought to be better, they can lead to overestimation of effects and waste of unnecessary research resources (Kyriazos 2018). We based our sample size on knowledge of common rules for exploratory factor analysis, such as a minimum sample of 50 (de Winter et al. 2009) and three to five subjects per variable (Cattell 1978; Gorsuch 1983), and confirmed our sample was adequate for the resulting factor solution.

Analysis

An exploratory factor analysis (EFA) was conducted in SPSS to determine the number of underlying latent variables and internal consistency of the items to be used for further analyses. This type of analysis informs survey designers of how many constructs (i.e., factors or components) the survey measures and which questions on the survey (i.e., items) best measure these constructs. Each item on the survey will “load” onto a factor. Factor loadings of greater than .4 indicate that the item is likely to be measuring the same construct as other items that loaded onto the factor. If an item has a factor loading of less than .4 or if it loads well onto more than one factor, it is probably not a good question for what the survey designer is trying to measure and should be removed from the survey.

Internal consistency, measured as Cronbach’s alpha, is one form of reliability and indicates how closely related the questions are. High values greater than .6 indicate that the questions are likely to be measuring the same variable; low values less than .6 indicate that one or more of the questions on the survey may not be measuring the same construct and should be removed from the survey. Once factors were identified and unnecessary items were removed, items for

each factor were averaged before performing correlations with age and comparisons between students, faculty, and individuals unaffiliated with the university.

RESULTS

Factor Analysis

Survey results ($n = 70$) for all 13 items were entered into an exploratory factor analysis. An oblique rotation (direct oblimin) was first performed to check the correlations between components. Component correlations were all between $-.32$ to $.32$, indicating that the factors were uncorrelated, so orthogonal Varimax rotation was used for the rest of the analyses. This rotation simplifies the interpretation so that survey designers can determine how constructs the survey is measuring. A principal components analysis (PCA) was then performed to determine if any items should be removed from the survey.¹ The Kaiser-Meyer-Olin measure verified the sampling adequacy for the analysis $KMO = .884$ (a good value according to Kaiser, 1974). Bartlett's test of sphericity, $\chi^2(78) = 590.604$, $p < 0.001$, indicated large enough correlations between items to perform a factor analysis. This means that our sample size was acceptable and that the analysis we performed was appropriate.

The 3 predicted components emerged. Factor one was comprised mostly of items related to access to research information (with additional items regarding open-access to data provided by publishers and libraries) and explained 46.128% of the variance. Factor two contained 3 items about library resources and explained 14.998% of the variance. Factor three was comprised of only 2 items regarding publisher's obligations and explained only 10.755% of the variance. The remaining items did not load as expected. The scree plot, factor loadings, and variance explained by each factor indicated that a model with two factors might better fit the data after removal of unnecessary items.

Because factor loadings for publisher values were weak or complex (loading onto more than one factor), these items were removed from the survey as well as library items with low factor loadings on Factor 2. A principal axis factoring with Varimax rotation with Kaiser Normalization was performed and the rotation converged in 3 iterations. Sampling adequacy was again verified ($KMO = .845$) and all KMO values for the remaining individual items were well above the acceptable limit of $.5$. Correlations between items were large enough to perform a factor analysis after removal of items $\chi^2(28) = 336.156$, $p < 0.001$. As predicted for the shortened version of the survey, two factors emerged: researcher's obligation to share information (explaining 47.398% of the variance; hereafter referred to as information sharing) and libraries' responsibility to provide services (explaining 18.317% of the variance; hereafter referred to as library resources).

Reliability of each subscale was determined by calculating Cronbach's alpha (Cronbach 1951, 297-334), which is typically considered to be unacceptable below 0.6 and excellent above .9

¹ Note that a similar factor analytic solution with the same interpretation was obtained using principal axis factoring

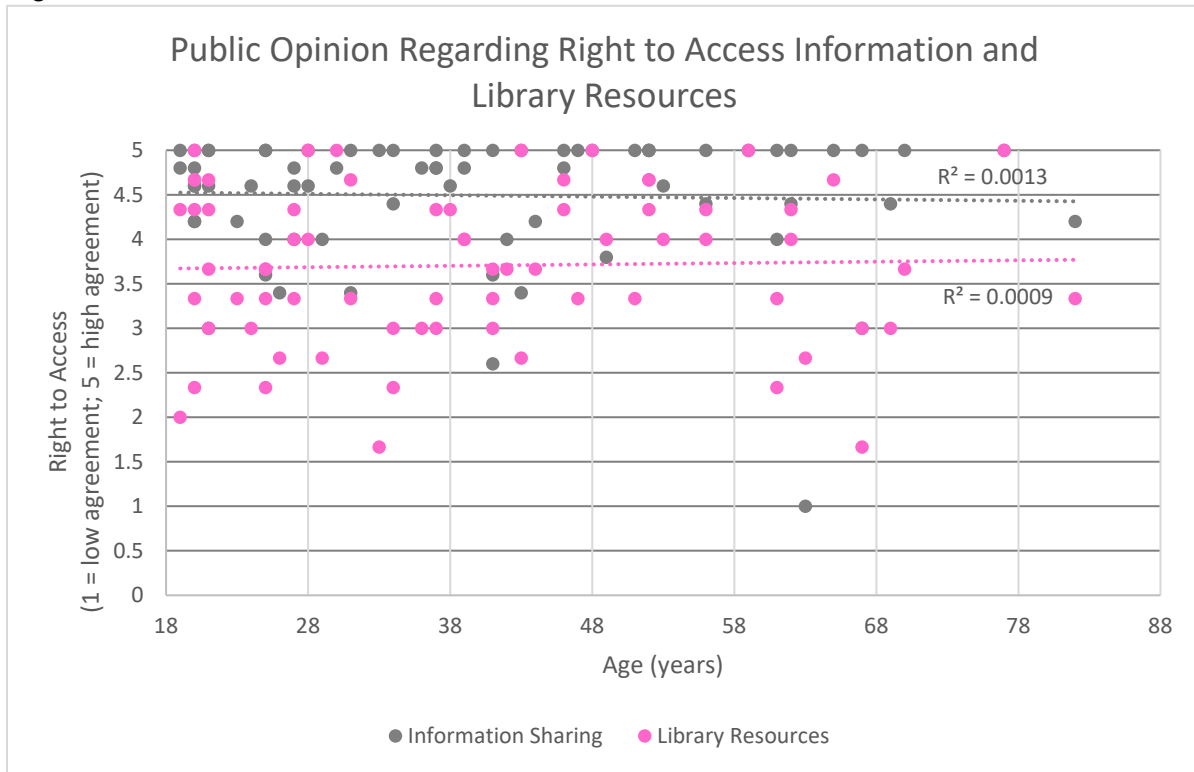
(Taber 2018, 1273-1296; Gierveld and Van Tilburg 2006, 582-298; DeVellis 2003; Nunnally 1978). Reliability was acceptable for library resources (Cronbach's $\alpha = .687$) and excellent for information sharing (Cronbach's $\alpha = .920$) subscales. Despite having two underlying latent variables, it may be possible to use the scale as a whole to assess public access to information attitudes, as the internal consistency of the complete scale is also high (Cronbach's $\alpha = .815$). The final factor analytic solution is presented in Table 1. Only the questions remaining on this shortened survey were included in further analyses.

Items on Final Survey	Factor Loadings Short Survey ^a	
	Information Sharing	Library Resources
The public has a right to know what researchers have been doing related to COVID-19.	.914	
The public has a right to the latest research data related to vaccines for COVID-19.	.899	
Researchers should make data public if it is related to vaccines created during a pandemic.	.894	
Researchers have a moral obligation to share past and current research pertinent to a disease that has caused a pandemic.	.756	
Research data should be stored in ways that the public can access for free.	.745	
Government-funded libraries should remain open during a pandemic.		.932
Libraries have an obligation to provide services to the public during a pandemic.		.536
Libraries are non-essential and should be closed during a pandemic. [Reversed]		.512
a. Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.		
Rotation converged in 3 iterations. Factor loadings greater than .5 reported.		

Age Analysis

Correlations of age with averaged scores for each factor were performed [Figure 1]. Age was not significantly correlated with attitudes about libraries, $r(68) = .03$, $p = .808$, or information-sharing, $r(68) = -.04$, $p = .769$. Regardless of age, there was overall agreement among participants that libraries should provide resources and information should be shared.

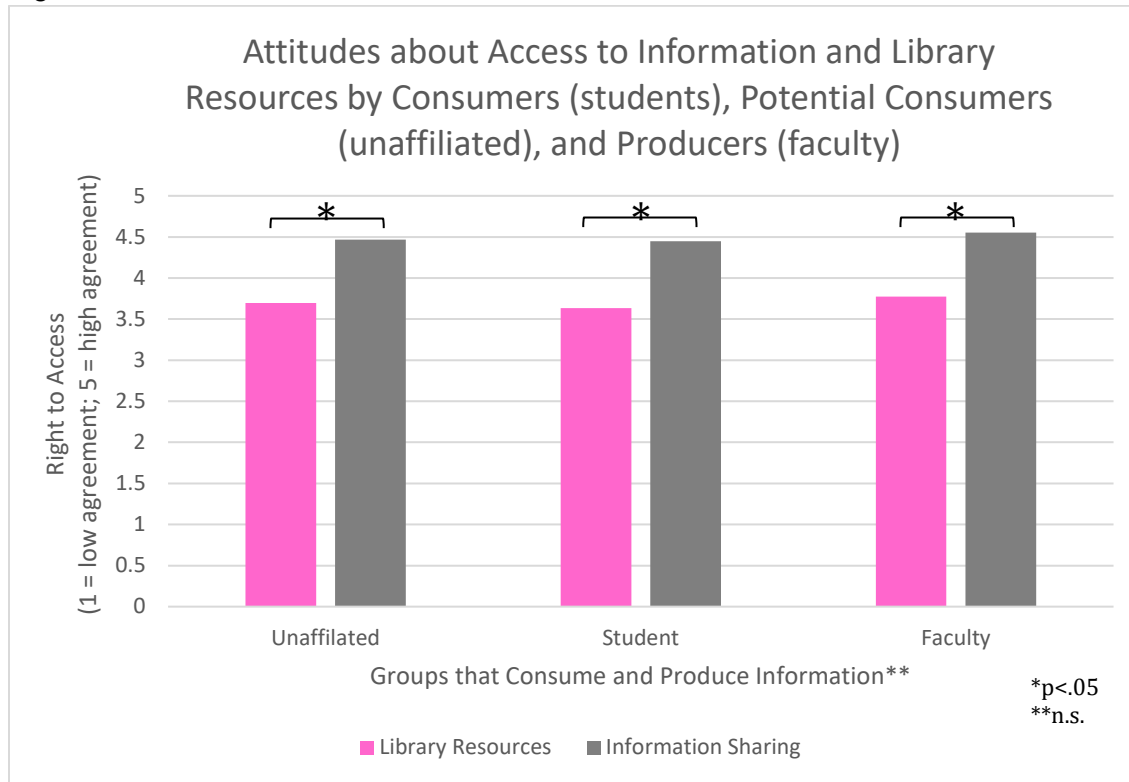
Figure 1.



Consumer vs. Provider of Information Analysis

Separate ANOVAs for library resources and information sharing scores comparing students ($n = 21$), faculty ($n = 25$), and individuals unaffiliated with the university ($n = 24$) revealed no differences in attitudes regarding library resources, $F(2, 67) = .143$, $p = .867$, or information sharing, $F(2, 67) = .137$, $p = .872$ [Figure 2]. Note that because the data were skewed toward high agreement, a non-parametric Kruskal Wallis Test was conducted with the same result for both library resources, $H(2) = .248$, $p = .883$, and information sharing, $H(2) = 1.346$, $p = .519$. Lack of age and affiliation-related differences can be explained by universally strong attitudes in favor of both information-sharing ($M = 4.49$; $SD = .72$) and library resources ($M = 3.70$; $SD = .87$), with a greater desire for information-sharing, as indicated by a paired-t-test $t(69) = 6.76$, $p < .001$.

Figure 2.



DISCUSSION

We created a 13-item survey that measures library, researcher, and publisher obligations to provide resources, services, and information specifically related to a crisis such as the pandemic. We administered this survey to the Texas A&M International University, which is located on the US-Mexico border, about 6 months into the global COVID-19 pandemic. Our target population included students, faculty, and individuals in the local community who were not affiliated with the university. Our goals were two-fold. First, we designed a survey to assess views about open-access and library usage; second, we used this scale to investigate whether individuals believe they have a right to information during a crisis, and whether attitudes about crisis-related information sharing differ by age and one's role in providing or consuming information.

The Open-Access & Library Usage (OALU) Scale

To measure attitudes about information sharing and library obligations, we first needed to create a reliable scale. The initial exploratory factor analytic solution of the survey revealed three underlying latent constructs as intended, but questions about publishers' obligations had lower complex factor loadings and problematic measures of sampling adequacy. Therefore, questions about publisher's obligations and items that did not contribute to the internal consistency of the survey were removed, as is typical during survey design. This method produced the OALA scale with two factors as predicted after item removal: researcher's obligation to share information

(information sharing) and libraries' responsibility to provide services (library resources). A first test of the scale indicated that it was reliable: all factor loadings were high and both subscales had strong internal consistency. The Open-Access & Library Usage Scale is freely available so any libraries can use this in the future.

Attitudes Across Age and Community Membership

We used this survey to investigate the public opinion regarding information sharing and library resources. We had proposed that younger adults would desire more open-access sharing of information and access to resources. However, the results showed no correlation with age, but rather that individuals of all ages reported beliefs in the libraries' responsibility to provide resources and even stronger agreement with the right to information access.

In addition to age, we predicted that the way in which people interact with information would predict beliefs. For example, students might be more inclined to desire more sharing of information and access to resources. But a clear and consistent result was found: in all three groups (students, faculty, and individuals unaffiliated with the university) there was strong agreement that libraries should provide library resources and stronger agreement that researchers should share information regarding their data and results. To summarize, regardless of age or role in data creation and consumption, there is strong agreement in favor of open access to resources and information.

Significance

This research has implications for the field of librarianship regarding the obligations of libraries to account for universal attitudes favoring public access to information and provide such access. Knowing that individuals demonstrate a strong preference for open access to information and that these attitudes do not differ between those who are providing (faculty) and consuming information (students) can contribute to funding allocation for these resources. This research is particularly innovative and timely, as attitudes about access when information is urgently and globally needed, as during a pandemic, is likely to differ from that which we would observe under different circumstances.

Diversity, Equity, and Inclusion

This work relates to equity, diversity, and inclusion as our research was conducted in a representative regional sample that included 40% Hispanic, 57% White and 3% Asian and Black participants (M = 15, F=55). While the study presented here did not directly measure the impact of demographic factors, we have finished collecting data in a follow-up study to analyze barriers to information access, including language and other demographic factors. This is particularly relevant because the COVID-19 pandemic has disproportionately affected the Latino community's health and economic situations. As a Hispanic-Serving Institution we are obligated and proud to represent and provide necessary resources for our community. We hope our research will guide stakeholders to advocate for additional resources or funding for underrepresented communities during times of crisis.

Understanding the local community and patrons is essential for libraries. The library needs to provide resources for underrepresented individuals, especially during a health crisis in which these individuals are at risk due to social, language, and institutional barriers. These results and the scale we have created can help librarians to leverage resources to assist their specific population.

Future Directions and Joint Obligations of Researchers, Publishers, and Libraries

Responsibility lies with the researchers, publishers, and libraries to find collaborative solutions for open-access datasets uploaded to repositories and published in open access journals. This stance is already being implemented by top-tier open-access journals (e.g., Nature Scientific Data), that have policies regarding licensing and repository partnerships to facilitate efficient data and information sharing. In addition, a system that values and rewards peer-reviewers would improve the quality of the review process and ultimately of publications.

The trend is that data is more available than it used to be. Companies have created apps and websites to share data quickly to mitigate symptoms of the slow publishing system (Academic Emergency Medicine 2021; ACS Publications 2021; New England Journal of Medicine 2021; JAMA Network 2021; Elsevier 2021; Cambridge University Press 2021; Unbound Medicine 2021; Springer Nature 2021; Wolter Kluwer 2021). But the academic model of research and peer-review has not caught up to the way we share and analyze data. The peer-review process can be lengthy and cumbersome, especially during a global health crisis (Palayew et al. 2020, 666-669; Huisman and Smits 2017, 633-650; Vlasschaert, Topf, and Hiremath 2020, 418-426; Litchfield, Shukla, and Greenfield 2021). Some researchers have been working towards faster access by publishing open-access datasets prior to publication with a journal. For instance, the COVIDiSTRESS Consortium published two datasets with combined responses from nearly 200,000 participants from over 179 countries (COVIDiSTRESS Global Survey Network 2020; Vestergren 2021). These datasets, along with pre-registration information and preprints, were openly available prior to the first publications, allowing for other researchers to rapidly analyze and write follow-up studies before the study was published in a journal.

Conclusions

Our main goals were to determine how library resources should remain available during a crisis and how funding should be allocated for information sharing. Most individuals, regardless of age and university affiliation, agreed that libraries have an obligation to provide resources during a crisis. We also found a strong preference for open access to information, among both consumers and providers of information. These findings suggest that open access to information in addition to providing information and resources during a crisis are fundamentally needed by the community. Libraries can leverage this need when seeking funding, resources, or additional staffing during times of crisis, especially to help the socially marginalized or members of the minority. Libraries can proactively prepare for such large-scale crisis situations by creating disaster preparedness teams, utilizing various communication methods, and pivoting resources and training to focus on services and tools that genuinely reflect the needs of their community users. If citizens are expected to help prevent the spread of a disease during a Pandemic they must not only be able to access relevant information but be involved in the processes, regardless of age, sex, race, socio-economic status, etc., or “we cannot consider a society an information society in which the vast majority of the citizenry are excluded from modern information and communication processes” (Pantserev 2017, 168-169).

Resources

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