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Our anonymous online research participants are not always anonymous and we sometimes breach their confidentiality. Is this a problem?

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Abstract

When educational research is conducted online we sometimes promise our participants that they will be anonymous – but do we deliver on this promise? We have been warned since 1996 to be careful when using direct quotes in Internet research, as full-text web search engines make it easy to find chunks of text online. This article details an empirical study into the prevalence of direct quotes from participants in a subset of the educational technology literature. The source of direct quotes could be found in 10 of 112 cases, and analysis of the articles revealed previously undiscussed threats from data triangulation and expert analysis/diagnosis. Issues of ethical obliviousness, obscurity and concern for future privacy-invasive technologies are also discussed. Recommendations for researchers, journals and institutional ethics review boards are made for how to better protect participants' anonymity against current and future threats.

Practitioner Notes

What is already known about this topic

- Direct quotes should be used cautiously in Internet research as they may reveal participant identity
- Our understandings of Internet research ethics are mostly based on theory and serendipity, rather than empirical work
- There are a variety of perspectives on the Internet as a public or private place to conduct research

What this paper adds

- Empirically-informed insights into the prevalence of anonymity-breaching direct quotes
- Awareness of two new threats to confidentiality: data triangulation and expert analysis/diagnosis
- A concern for future privacy-invasive technologies and their impact on participant anonymity

Implications for practice and/or policy

- Recommendations are made for reducing risk of harm to participants from direct quotes
- Future technologies should be considered when making decisions about participant anonymity
- Researchers are cautioned against making unqualified promises of anonymity

Introduction

When students, teachers, or others participate in research we often make them promises: that they will be anonymous; that information they reveal to us in confidence will not be linked to their identity; and that we will be careful with their data. Unfortunately we don't always keep these promises. This article quantitatively examines the prevalence of such breaches of anonymity in a subset of the educational technology research literature. It goes on to propose a set of recommendations for institutional review boards, journals and researchers on how to better protect participants from current and future threats to their anonymity.

The World Wide Web is a boon for researchers and readers of research. As researchers we have access to tools that are the object of study as well as an automated instrument of data collection; see the emergence of phrases like "Data for free" (Black, Dawson, & Priem, 2008). As readers, in addition to the ability to find new research articles, we can also access support materials; instruments; and even contact the researchers.

When reading particularly interesting research papers I often Google to find further information, hoping to stumble across a project website or other publications by the researchers. While searching for further information on one particular research project, I stumbled across more than I was looking for: a large dataset, containing names; telephone numbers; addresses; unique identifiers; and dates of birth for hundreds of research participants. I contacted the relevant institutional review board, who attributed the breach to an accident made by a junior research assistant. While searching for more information on other research articles I have found other more benign data, including student blog/discussion/wiki contributions that obviously formed part of the dataset for these papers.

Most of our evidence-based insights about Internet research ethics come from accidental or serendipitous learnings while conducting Internet research, like my experiences here. There are few empirical studies directly into Internet research ethics (Hudson & Bruckman, 2005). A problem with relying on theoretical or accidental ethical understandings is that they might not actually represent reality. As an example, for the research ethics concept of *voluntary consent to participate*, it is sometimes assumed that participants in public Internet discussions implicitly consent to be part of research studies (Pittenger, 2003). However, when this was investigated experimentally by Hudson & Bruckman (2004) the results were surprising. When they entered ICQ chat rooms ($n=109$) and announced their presence as researchers, they were kicked out 63% of the time ($n=69$); interestingly, when participants were offered an option to 'opt-out' of the study the researchers were kicked out 72% of the time, but only two of 443 participants formally opted out. Without empirical work like Hudson & Bruckman's (2004) we risk constructing an understanding of Internet research ethics that is not supported by reality.

We may have little empirical evidence about participant anonymity in online research, but we have known for more than a decade that some practices might breach it. As an example, consider Eysenbach & Till's (2001) recommendations:

by quoting the exact words of a newsgroup participant, a researcher may breach the participant's confidentiality even if the researcher removes any personal information ... the original message, including the email address of the sender, could be retrieved by anybody using the direct quote as a query. Participants should therefore always be approached to give their explicit consent to be quoted verbatim and should be made aware that their email address might be identifiable. (Eysenbach & Till, 2001, p. 1105)

This is not an obscure article: it was published in BMJ and has been cited >300 times by researchers from many disciplines. Even earlier, King warned us in 1996 not to use direct quotes in case the participant or another member of an online community coincidentally read the article and recognized the quote belonged to a particular person. Going further back, guidelines from the American Psychological Association's 1992 Code of Conduct (American Psychological Association, 1992, in Pittenger, 2003) were later interpreted by Pittenger to require

removal of references to the person's name or pseudonym, and other information that could potentially identify an individual; and removal of reference to the name of the group. (Pittenger, 2003, p. 53)

Despite these warnings, adherence is not universal and there are cases where participants have been harmed as a result. In one such case, a researcher analysed a disagreement that took place on an obscure part of a large public website, and used the usernames of the participants in his book without asking. The additional attention and scrutiny experienced by one participant led them to leave the community after many years of involvement. The participant later blogged about the harm they experienced, which could have been avoided if their anonymity was not breached by that researcher.

Given that (a) we know that direct quotes can breach participant anonymity; (b) we know that a breach of anonymity can lead to harm; and (c) we lack empirical work to understand how prevalent a problem this is, this paper addresses the question:

For a small subset of the educational technology research literature, how prevalent is the breaching of participant anonymity through direct quotes, and what is the risk of harm from these breaches?

Methodology

This study gathered 112 journal articles and doctoral dissertations (henceforth referred to as *articles* for simplicity) and used basic searching techniques to establish if the identities of participants could be found. The precise methods used for searching the literature and establishing the anonymity of participants are not described in this article to protect the participants of those studies.

When searching the literature, all articles related to a few chosen educational technologies were considered, regardless of discipline, level of education or nationality. The corpus of articles includes pieces from a range of peer reviewed

journals, including top-tier and emerging journals. Some articles were from specialist educational technology journals, and others were from generalist education or discipline-specific journals. A small number of doctoral theses were also included. To be included, the articles needed to focus on either the technology, or on uses of the technology for education.

The initial target number of articles was 100, and as it took me five hours to process 20 articles I employed a research assistant for 20 hours to process the remaining 80 articles. The research assistant was quicker than I was, and processed 92 articles in this time, resulting in a final dataset of 112. The research assistant determined if direct quotes were present in each article, and if the source for these quotes could be identified. I then performed a close reading of the articles with identifying direct quotes and grouped them into categories.

Ethical conduct and reporting of this study

The methodology and ethics of this study were discussed in detail with peers at a methodology symposium (Dawson, 2010) and with colleagues from a relevant faculty research group. In the conduct of this study, no participant data was kept, and the unit of analysis is the published research study itself, not the participants in those studies. I discussed transparency of method required for peer review of this article with the Editors of this special issue. They have requested that documentation about the search and analysis approaches not be revealed to themselves or peer reviewers.

Results

Of the 112 articles considered, 31 had no direct quotes from participants. Of the articles with direct quotes from participants, the source could not be found for 71 articles, and the source could be found for 10 articles. Table 1 shows the breakdown of these articles by article type.

Table 1: Article type and sources for direct quotes from participants

	<i>Journal</i>	<i>Thesis</i>	<i>Total</i>
No direct quotes from participants	31		31
Direct quotes from participants, source unknown	61	10	71
Direct quotes from participants, source known	9	1	10
	101	11	112

A close reading was performed on each article that had direct quotes from a known source, to understand the nature of each study and the ethical implications of the direct quotes. Four categories were identified based on the potential impact on participants and they are summarized in Table 2, then defined and discussed in the next section.

Table 2: Categories of articles for which the source of direct quotes was found

	<i>Journal</i>	<i>Thesis</i>	<i>Total</i>
Evidence of ethics review including agreement from participants to publish identifying data	1		1
No attempt at anonymising participants and no mention of ethical considerations	5		5

Attempts to anonymise, but participants are identifiable (no triangulatable data)	1		1
Attempts to anonymise, but participants are identifiable (triangulatable interview data and web identities)	2	1	3
Total identifiable	9	1	10

Evidence of ethics review including agreement from participants to publish identifying data

One article described receiving ethical clearance from an institutional review board to publish identifying data. This was supported by agreement from participants and policy from the online community under investigation. The participants were also clearly public individuals who sought to connect with the broader Internet around their topic of interest; if the article's analysis of the participants or their community brought them publicity then this would likely be a good thing. Articles in this category would be unlikely to cause participants harm. This article is not from an educational technology journal.

No attempt at anonymising participants and no mention of ethical considerations

Five articles did not attempt to anonymise or pseudonymise participants, and also did not discuss ethical matters at all. One article even included a quote from a participant that included their email address. None of these five articles contained any other participant information (such as interview quotes) that could be linked to the direct quotes and matched to an individual's identity. The participant quotes were mostly benign: small talk; non-sensitive course content; experiences from practicums. However one article discussed sensitive information, and included expert professional analysis by the researchers that the participants may prefer was not public. By omitting a discussion of the ethical issues around these five studies, their authors make it difficult to judge – perhaps their participants were entirely aware of the nature of the research projects and how their data was handled; or perhaps the authors were just oblivious. Four of these articles were from educational technology journals.

Attempts to anonymise, but participants are identifiable (no triangulatable data)

One article demonstrated a desire to protect the identity of participants, and assigned them pseudonyms, however it was trivial to find the source of the participant quotes and their real names. Given the nature of the topic the article discusses it is likely an interested reader would accidentally discover the participants' identities. The article includes a substantial discussion of the ethics of their approach, including specific mentions of the need for participant consent and anonymity. Fortunately it is not possible to link the de-anonymised participant identities to any other confidential information that was revealed to those authors; the article doesn't 'triangulate' any public and private data together. This article is not from an educational technology journal.

Attempts to anonymise, but participants are identifiable (triangulatable interview data and web identities)

Three articles made failed attempted to anonymise participants and also connected public web data with information revealed in confidential interviews. Although these articles pseudonymised participants, direct quotes from the public web were attributed to these pseudonyms, which in two of the three articles led to the real names of the participants; the other article only led to the first names, school, year level and teacher of the participants. Through the pseudonyms and quotes, it is trivial to connect

information revealed in interviews to the actual identities of these participants. In two of the papers the interviews add only benign details. In the other paper very sensitive personal information is disclosed in the interview. One of these articles was a doctoral thesis, and the other two were published in non-educational-technology journals.

Discussion

It is reassuring that most articles did not contain any direct quotes from participants that could be found using our unsophisticated methods, but it is difficult to determine exactly how alarming the other ten papers are. Certainly the paper that obtained permission from participants to reveal their identity could be viewed as a benefit to the participants, who desired publicity for their online presence. But the remaining nine articles demonstrate a variety of ethical concerns.

Obliviousness or lack of details in reporting

The five articles that make no mention of ethics and no attempts at anonymising participants are not just the result of a group of authors omitting details: they are also the result of reviewers and editors not viewing this as a concern. As these articles were from middle-tier and regional/emerging journals, it's possible that this is part of a more general research quality issue. It is also possible that regional or sub-disciplinary approaches to research ethics prefer to omit these details for the sake of word limit. For transparency's sake – and to save us from unnecessary concern – authors should include a brief statement of ethical review or consideration when they use participant data. Calls for ethical guidelines for the reporting of Internet research date back to at least 1996 (King, 1996), and progress has been made in some fields. Medical journals often have policies about reporting ethical approval (for example, Drummond, 2009) and publish research about adherence to these policies (for example, Schroter, Plowman, Hutchings, & Gonzalez, 2006; Yank & Rennie, 2002), however similar studies could not be found in educational technology.

Identity and obscurity

It was possible to establish the real names of some participants in some studies. This might not actually be a problem; they have already published their names on the public web, what does it matter if an obscure academic text reveals them? Here we encounter the familiar Internet ethics problem of the public/private nature of the Web (Pittenger, 2003). Are communications on a discussion board more analogous to a conversation in a public space, a series of letters to the editor of a newspaper, or a quiet chat behind closed doors? If researchers specify their stance on the public/private nature of the data they are investigating then reviewers, editors, readers and institutional review boards can debate their proposed methodology.

Breaking promises

In four articles, the researchers made promises to participants about protecting their identity that were easily broken. Without seeing the exact agreement entered into between researchers and participants, it is difficult to know how qualified this promise was; hopefully the participants were just promised that the researcher would make their best efforts to protect participant anonymity. Given the results of this study, researchers would be wise to never make an absolute promise of participant anonymity.

Expert analysis and diagnosis

Researchers have the ability to perform expert analysis, even diagnosis, upon non-sensitive public data that can produce sensitive personal information. As an extreme example from outside of education, consider a hypothetical medical researcher investigating the prevalence of Fetal Alcohol Syndrome (FAS) through diagnosis of public Facebook profile pictures. The names and profile pictures are public, but a diagnosis of FAS is deeply personal; it's not possible for that researcher to reveal the public part of this data in a paper without also sharing the personal information generated by their expert analysis. An education example could be conjured from diagnosing dyslexia in school children from blog posts; the posts might be public but the diagnosis is private, and attributing direct quotes to dyslexia sufferers reveals sensitive information. Only one article conducted this sort of expert analysis, and researchers should be cautioned in presenting these sorts of findings.

Triangulating public data with confidential data

Triangulation is often regarded as good practice in qualitative research (Seale, 1999) and there is often a temptation to show how data from different sources support or contradict each other. Unfortunately, data triangulation enabled linking of confidential information with public information in three articles, and in one case the confidential information appeared sensitive. It is difficult to construct circumstances where the potential for harm from breaching confidentiality would be outweighed by benefits from using direct quotes; researchers should be cautious in how they present data triangulation that mixes public and private sources.

Concern for future privacy-invasive technologies

This study used unsophisticated, freely available tools. Although web search engines have become increasingly more sophisticated over the past two decades, this study could have been performed with the technologies present in the WebCrawler search engine in 1994: full-text search of a database built from crawling web links (Pinkerton, 1994). The technology has existed since 1994 and we have been cautioned about it since 1996; I speculate some researchers lack the web-search prowess or awareness that this is possible. Future privacy-invasive technologies may catch us equally unaware, and may reveal participant information from many more articles, even those without direct quotes. The semantic web may make it possible to connect the meaning of a participant's blog post directly to their blog – even if no direct quotes are published. Identity aggregator tools might automatically match components of a participant's online identity together in ways that assist de-anonymising. Government agencies like the CIA openly try to “collect everything and hang onto it forever” (Hunt, 2013), but perhaps nefarious groups may also exist with similar technologies too. Rather than focusing on existing threats to participant anonymity, we may need to revise if it will actually be possible to protect anonymity in the long term, and advise participants of possible future risks.

Recommendations

This article reiterates Eysenbach & Till's (2001) call for researchers to be cautious when using direct quotes from participants' public web data, and reinforces it with empirical evidence that anonymity breaches are happening, and they have the potential to cause harm. In this section I outline recommendations for researchers, reviewers/editors and institutional review boards to minimize the risk of further anonymity breaches from direct quotes.

Recommendations for researchers

When using direct quotes from participants' online activities, researchers should:

- Consider using privacy settings, such as setting a class blog to private
- Ask participants for permission to use direct quotes
- Inform participants about the risk of using direct quotes
- Avoid connecting direct quotes to any information revealed in confidence, such as an interview
- Report analysis of direct quotes carefully, to avoid connecting a sensitive expert critique or diagnosis to a participant's public presence
- Consider the impact of future technologies on the anonymity of participants, and only use direct quotes if the benefit outweighs the risk
- Comment on the ethics of their study when writing about it, including what has been communicated to participants about anonymity

Recommendations for journals, editors and reviewers

When considering articles that use online participant data, journals, editors and reviewers should:

- Consider the above recommendations for researchers
- Require a brief statement about ethics
- Have clear, documented, public processes for addressing breaches of identity in published articles and articles under review

Recommendations for institutional review boards and ethics committees

When considering applications for ethics approval, committees should:

- Consider the recommendations for researchers
- Specifically ask if direct quotes from public web data will be published, and why they will be published
- Consider the potential risk of harm against the potential benefits of publishing direct quotes or triangulating them with confidential information and/or expert critique/diagnosis
- Establish clear, documented, public processes for addressing breaches of anonymity

Conclusions and a call for future work

This article contributes to addressing Hudson & Bruckman's (2005) call for more empirical research into Internet research ethics, and confirms their suspicions: the way we thought the ethics world should be (per Eysenbach & Till's recommendations) does not match reality. With basic search techniques it was possible to establish the identities of participants in 10 of 112 articles. The number of these studies that are problematic is an ethical judgement left to the reader.

This article makes no claims that the 112 articles are at all representative of the broader educational technology literature, and its findings are not necessarily generalizable. It does however confirm that a problem exists. The magnitude of this problem could be investigated through a larger quantitative study, however the attitudes of our participant populations to this sort of problem might be even more

interesting. This study is primarily grounded in western, English-speaking educational research; attitudes towards anonymity may vary in other contexts (Capurro, 2008).

I conclude with a request: that we are more honest and transparent with ourselves, our peers and our participants about how we handle anonymity. If we can no longer deliver on promises to provide anonymity, we should stop making them.

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