An edited version of this chapter was published as

Santo, R. (2012). Hacker Literacies: User-Generated Resistance and Reconfiguration of Networked Publics. In J. Avila & J. Zacher-Pandya (Eds.) *Critical Digital Literacies as Social Praxis: Intersections & Challenges.* Edited volume in the New Literacies and Digital Epistemologies series. New York: Peter Lang.

Hacker Literacies

User-Generated Resistance and Reconfiguration of Networked Publics

RAFI SANTO

INTRODUCTION

In this chapter, I want to address what I see as emerging forms of literacy in digital culture and in doing so answer what I believe to be important questions: What role might criticality play in the age of participatory media? How are values-based questions like those relating to corporate control most relevant in a world where the one-to-many broadcast media is but one component of a many-to-many participatory media culture? Where can we currently look to see critical and empowered digital practices at play? And how can these in situ cases that merge critical and participatory mind-sets guide us as we conceptualize emergent literacy frameworks?

In the first half of this chapter, I explore the theoretical contours of hacker literacies and share why I see them as necessary, and in the second half I aim to show how hacker literacies are currently being practiced in situ in order to ground the construct in lived experiences. I share examples of how users are currently resisting and reconfiguring networked public spaces, such as the mass uprisings in response to Facebook privacy changes, the invention of the hashtag on Twitter, and a teen-led protest movement in a virtual world.

Hacker literacies, characterized simultaneously by criticality and participation, are a response to a shifting media landscape. In the past, communications media evolved at a rate that pales in comparison to what we're experiencing in the 21st cen-

tury. Even then, it was not a simple task to conceptualize what it meant to be literate with media. At the same time, despite what pundits and some watchers of the digital space might brashly proclaim, we are not entirely in a "brave new world" where "everything is different"; we have much to gain from looking at the rapid change before us through some existing, well-developed lenses, tinkering and adjusting them to our new circumstances as needed rather than starting from scratch.

What I call "hacker literacies" are just that—a cobbling together of two existing paradigms for understanding what it means and looks like to be literate with media: critical media literacy and participatory media literacies. (Use of the singular, 'literacy,' and plural, 'literacies,' is intentional here and based on how these existing bodies of literature characterize themselves.) Hopefully in this process of theoretical concoction, a Frankenstein isn't created, though the examples of hacker literacies I'll share here point, I believe, to the fact that not only does this synthesis already exist in real-world practices regardless of theory, but that those practices are not monstrous in their nature by any means. To the contrary, I believe the examples I will share later in this chapter are important signposts on the road to figuring out how we should be educating young people to be literate with media in the 21st century.

SYNTHESIZING MEDIA LITERACY FRAMEWORKS

What it means to be literate with communications media has always been a moving target (Hannon, 2000)—media inevitably change, and when they do, so do the social practices that surround and shape them. And so as a society we've always done our best to document and understand what it means to be literate in these practices.

What I refer to as the "first wave" of these literacy frameworks, critical media literacy, responded to the explosion of broadcast media in the 20th century. TV, radio, film, and the press enriched society—they provided new forms of artistic and popular culture, broadly accessible information about politics, and the possibility of understanding and connecting with a wider world. And they simultaneously presented risks. With media controlled by just a few interests, political bias, propagation of problematic stereotypes, and lack of attention to issues deemed unsavory by those in power became regular features, and, to many, flaws of the mass-media landscape. Critical media literacy offered itself up in response to these sorts of issues. It advocated practices that empowered young people in relation to the messages of mass media, asking them to question the intent, assumptions, and biases of media producers (Buckingham, 2003; Hobbs, 2006; NAMLE, 2007). Who made this TV show? What kind of culture is it promoting? Who is this ad targeting? What techniques is it using to make me want to buy the product? These are hardly questions that should go out of vogue.

Yet at the start of the 21st century, we saw a new paradigm for media literacy emerge. The advent of the Internet and the broader participatory culture surrounding it heralded a number of "second wave" media literacy frameworks, most prominently the new literacies studies (Gee, 2007; Lankshear & Knobel, 2006, 2007) and new media literacy (Jenkins, Clinton, Purushotma, Robison, & Weigel, 2009), that I refer to collectively as "participatory media literacies." This framework recognized that participatory forms of interaction through new media (blogs, wikis, social networks, virtual worlds, etc.) were becoming broadly accessible, and proposed that a new set of literacies were organically emerging that focused on how people can leverage and participate culturally through new media, empowering them not simply to be consumers of culture, but producers of it as well.

In practice, while critical media literacy would have a person ask how a cable news program might contain political bias, participatory media literacies would then have them engage in authentic blogging practices within a broader online civic community so that they could spread their own political views within a broader ecology. In short, one advocates criticality in response to media while the other encourages participation through it.

Both of these paradigms are crucial, and there remains significant work to promote the kinds of practices they value. At the same time, something is missing—the current conversation happening around participatory media literacies concerning empowerment *through* new media has seldom incorporated ideas about empowerment *in relation* to new media. For example, questions about what agendas are implicit in the very design of these new participatory tools don't get asked very often. These are the sorts of questions critical media literacy would ask about a media message. Additionally, more work could be done to understand the ways that the practices associated with participatory media literacies can be used to advocate for substantive changes to the design of these sociotechnical spaces when they fail to align with a person's values.

Drawing from many of the strengths of the critical media literacy and participatory media literacies traditions, there lies the potential to address this problem through the proposal of a "third wave" media literacy framework that I refer to as hacker literacies. Hacker literacies are a set of practices that support an individual to become empowered *in relation* to participatory digital media, such that the design and norms of sociotechnical spaces and the intentions of their creators and associated communities are not taken for granted. Rather, they are seen as malleable avenues for expression of the values and agendas of the individual user, as opposed to solely those of the designer or dominant community. Important to note is the fact that hacker literacies as a construct does not seek to impose any normative ideological "right response" to technologies or people aside from one that assumes active engagement with sociotechnical spaces based on the values one brings to them.

In defining hacker literacies, I take inspiration from many within the critical media literacy and participatory media literacies traditions, as well as from Constructionist learning theorists such as Papert (1980) who were interested in ensuring that it is the child who programs the computer, rather than the other way around.

I define hacker literacies in this way: empowered participatory practices, grounded in critical mind-sets, that aim to resist, reconfigure and/or reformulate the sociotechnical digital spaces and tools that mediate social, cultural, and political participation. These "critical mind-sets" include perceiving how values are at play in the design of these spaces and tools; understanding how those designs impact the users of those spaces and tools; and developing empowered outlooks, ones that assume that change is possible, in relation to those designs rooted in an understanding of their malleability. "Empowered participatory practices" include making transparent for others the values at play in and effects of sociotechnical designs, voicing alternative values for these designs, advocating and taking part in alternative designs when spaces and tools are misaligned with one's values, and employing new media as a means to change those digital spaces and tools whether on the social or technological level via social or technological means.

I will highlight how I'm conceiving of literacy and sociotechnical spaces below, but will for the most part let the examples in the second half of this chapter illustrate the construct of hacker literacies in terms of the critical mind-sets and empowered participatory practices that comprise it.

When I say literacy and literate practices, I am referring to existing sociocultural conceptualizations of literacy and looking specifically to a definition put forth by Lankshear and Knobel: "socially recognized ways of generating, communicating, and negotiating meaningful content through the medium of encoded texts within contexts of participation in Discourses (or as members of Discourses)" (2006, p. 64). A key idea in their notion of what counts as a literate practice is the intersection of a technology (though not confined to digital ones), knowledge (including values, attitudes, and beliefs) and skills and associated actions.

In this case, the technology is indeed digital—it is those sociotechnical digital spaces that increasingly mediate participation in civic, social, and political life. I refer to these spaces as sociotechnical since they are simultaneously made up of technical features and social actors existing in dialectic relationship with one another. Technical features afford and constrain certain social behaviors, and at the same time are always themselves shaped by social actors, whether they are users, designers, or other stakeholders. This dialectic relationship, of course, is what makes these spaces malleable, and so is foundational to their reformulation and reconfiguration through various practices.

While many digital spaces are explicitly social in their design, such as social network sites like Facebook or interest-driven community sites such as

AnimeMusicVideos.org, for the purposes of hacker literacies I also include digital technologies that are not explicitly social, such as media production tools like Photoshop or FinalCutPro as well as other computer applications. These tools have important roles in mediating what kinds of participation are possible in the 21st century, and are themselves, of course, designed and iterated upon by social actors and as such deserve our attention.

ON HACKERS

When I use the term "hacker" here, I'm not talking about any malicious or unethical people, a misapplication of the term often used in popular culture and mainstream news contexts,[1] but am pointing to the critical and participatory ethos of the hacker community that revels in collaborating around, tinkering with, and reconfiguring technology from an empowered space that assumes these actions are both possible and desirable.

I also would warn against seeing hacker literacies as totally technical. As with the assumption that hackers are malicious, the assumption that hackers are solely solitary writers of code is also in need of a bit of corrective. That imagery is a far cry from how most people that engage in creative production with technology operate, and this is especially true in the case of computer programmers. From its origins, hacker culture was deeply communal, with a strong ethos of sharing and collaborating, of contributing both expertise and code to others. Within that culture are a range of practices, some more technical in nature, such as individual debugging of a compilation of computer code, and others more social in nature, such as advocating for the adoption of a new common technical standard and engaging in collaborative projects. The same is true for hacker literacies—some of the ways that people aim to reformulate sociotechnical spaces are more technical in nature while others are more social.

ON EMPOWERMENT

As a final note in this more "definitional" section, I want to briefly address the usage of the word "empowerment," which is quite commonly used in educational contexts, especially by those advocating for critical perspectives. I have already used, and will continue to use, terms like "empowered digital practices" and "empowered mind-sets" in this chapter, and given that, I think it's important to be clear on what I mean when I say empowered. As Lankshear noted, "If people do not recognize and address the

vague semantics and ambiguity of 'empowerment,' they may well fall for educational agendas they would otherwise have rejected on the grounds that they are in fact manipulative or oppressive" (1997, p. 64). He suggested the usage of a simple schema for clearly outlining what one means when using the term empowerment within a given context. For the purposes of talking about hacker literacies, the schema looks like this: users of digital participatory media (the subjects) are empowered in respect to the designs and formulations of those media (a particular aspect of the structuring of power) through engaging in hacker literacies that are based on an understanding of those media as changeable (a process) such that those media become reformulated to reflect the values of the user (the valued ends/outcome).

WHY BOTHER? EMERGING FORMS OF NEW MEDIA RISK

The example of synthesis I provide here is not just an academic exercise to see what happens when we remix theory; the practical stakes are high. Despite how important it is to not sound alarm bells when talking about digital culture at a time when traditional media and the government have developed a bad habit of making mountains out of molehills, such as in the case of overblown fears about online predators (Collier, 2011; Wolak, Finkelhor, Mitchell, & Ybarra, 2008), there are in fact substantive emerging forms of risk and media manipulation that we are going to have to face up to as a society.

Foremost in the mind of the public is the issue of privacy, a wide-ranging topic concerned with personal information posted online and its accessibility by various interested parties, whether they are other citizens, journalists, private companies, or governmental agencies. Emerging research is showing that users of online tools care about privacy issues, though not in ways that are evenly distributed among users (boyd & Hargittai, 2010)—a fact that has important implications in terms of who remains at risk. In more mainstream contexts, privacy issues are receiving deep scrutiny by the press, as evidenced by the *Wall Street Journal*'s series of reports on the subject, ominously titled "What They Know" (2010), displayed prominently for almost two years and counting in the technology section of the newspaper's website.

While much of the concern around privacy issues has focused on the role of companies in tracking online behavior and selling data to marketers, there is increasing scrutiny on the intersection of government and privacy issues as it relates to surveillance. With social media now established in their role as central tools in organizing, though not predicting the success of, public protest (Shirky, 2011), governments the world over have an increased stake in surveilling these technologies. Even in the United States, the Obama administration has proposed new laws

that would give the government centralized "back-door" access to encrypted emails, peer-to-peer communication services such as Skype, and social network sites such as Facebook (Savage, 2010), a move that if successful would afford unprecedented governmental access to vast amounts of information with major implications for privacy and democracy.

Beyond privacy, many have begun to look at how the formulation and availability of certain technologies are norming sociality in new ways. Research has established that even when presented with the opportunity and ability to customize software according to their priorities, most people end up using the default settings (Mackay, 1991). This fact gives major power to the designers of technology in terms of how successful they will be in promoting certain types of behavior over others.

Research by the Pew Internet and American Life Project also hints at how the rise and decline of certain technologies correlates with changes in societal behaviors. A report about teen social-media habits (Lenhart, Purcell, Smith, & Zickuhr, 2010) documents how the number of teens blogging declined dramatically, by a full 50 percent, from 2006 to 2010. While not explicitly linked in the report, it is notable that during this same time period there was a major influx of teen users to Facebook from MySpace. That the decline in teen blogging correlates to a move to Facebook, which does not have a blogging feature, as contrasted to MySpace, which prominently displayed this functionality and had a strong blogging culture, is a fact not lost on many teen social-media watchers.

In a similar vein, emerging research on personalization of online spaces and tools is showing how an increased ability to deliver customized services might actually contribute to a balkanized Internet in which we're less likely to encounter views that challenge our own, a long-held, though contested, fear of many Internet researchers (Lessig, 2004; Sunstein, 2001). In his book *The Filter Bubble,* Pariser (2011) shared how the results displayed on Google are increasingly differentiated depending on what Google knows about you based on past behavior, to the point that we no longer have a common public experience of what results show up when a person searches for something as simple as "Egypt." He pointed to the fact that the current logic by which various websites personalize their user experiences, or even that they do, is increasingly non-transparent for those whom it affects the most: the user.

Finally, increased attention is being given to the possibilities and realities of exploitation of online activity. The increase in user-generated content online has coincided with the monetization of much of that content through what some call an "architecture of exploitation" (Petersen, 2008). Google Image Labeler, for example, engages people in an interactive matching game in which two people simultaneously look at the same image, with one person trying to get the other person to guess what the picture is of without using certain common keywords. In the process, enormous

value is created for Google, whose image search is now that much more accurate. While the proposal that this is an exploitative practice is complicated by the fact that users get entertainment value in the process, these continuities between online labor, play, and value exchange merit scrutiny (Sholtz & Liu, 2010).

All of the examples are not here to serve as more fodder for a culture of fear around the Internet and technology. I personally believe that the flourishing of participatory culture that coincided with rise of the Internet is something we should be proud of as a society. At the same time, its development wasn't an accident: many people were very intentional about what they wanted from these technologies, and technology took shape accordingly. I point out these emerging forms of risk to highlight the reasons that the public needs to continue to engage with technology intentionally, and according to considered values, rather than assume that it is always being developed according to the public's best interests. These examples lay the groundwork needed to highlight what I see as new practices that acknowledge and are already actively responding to these types of issues, responses that form the basis of how we might understand hacker literacies.

HACKER LITERACIES IN CONTEXT

One of the central things that I'd like to convey in this chapter is not just the idea of what hacker literacies are, but also that this is a phenomenon well under way in current culture. In this section, I explore a number of examples of this so that various dimensions of hacker literacies can be made more transparent.

The great Facebook privacy debacle of 2010

Facebook has a well-documented history of making controversial, and some believe ham-handed, decisions when it comes to issues of privacy on its social network site (boyd & Hargittai, 2010). But the particular situation I'd like to talk about, referred to by some as "The Great Facebook Privacy Debacle of 2010" (Beale, 2010) resulted in what was arguably the greatest negative reaction up to that point among not only its users but also larger cultural, social, and political actors.

In late April of that year, Facebook announced at their annual F8 conference two new features: Instant Personalization and Social Plugins (McCarthy, 2010). Both of these changes to the popular site aimed to leverage a user's personal connections within Facebook to augment and "add value" to their usage of third-party websites.

The particularities of these features themselves are less important than the fact that both of them included new kinds of access to personal information not just for

third-party websites but also for any interested party. A lack of clarity in terms of what user information was now available to whom in this process was the antecedent to an extended public backlash that included Facebook's user base, government actors including United States senators and regulators at the U.S. Federal Trade Commission, activist groups such as MoveOn.org and the American Civil Liberties Union, and a range of journalists from both technology-oriented and mainstream news sources.

In a study of the incident, I examined responses of 242 individuals to the situation in terms of how they evidenced hacker literacies. I applied a coding scheme based on the theoretical construct to 280 comments posted to mainstream (*New York Times*, *Washington Post*) and technology-focused (Mashable, Techcrunch) news sources on articles about Facebook's privacy changes (Santo, under review). The data contained a wide diversity of both the critical mind-sets present in hacker literacies as well as the empowered participatory practices that are expressions of those mind-sets.

Critical mind-sets

The critical mind-sets at play in the data largely fell into two categories: pointing to the effects of the new designs for users, and interpreting the values and intentions that drove those new designs.

In this first category, many pointed to ways that the new privacy settings had practical negative consequences for users, such as this individual: "By making a connection on FB, I'm invading that connection's privacy: revealing that connection's identity to the world, making the person behind that connection searchable" (fjpoblam, posting on Techcrunch.com). Beyond considering Facebook less useful and being disinclined to use it, this individual pointed to specific design implications that could result in personal and professional issues arising through the simple, and central, act of adding someone as a "friend" after the new privacy setting changes were implemented. This evidences a form of design thinking in which a person links the particular designs of a tool or space to the kinds of behaviors afforded or constrained and the implications this has for the user—a cornerstone of hacker literacies.

Those who fell into the second category of critical mind-sets, pointing to values and intentions behind the new designs, were more explicitly political in their commentary, such as this individual's implied comparison of Facebook to the fictional regime in the book *1984*: "They are not redefining privacy, they are debasing the language of privacy. George Orwell understood this principle completely: newspeak" (Anonymous, posting on Mashable.com). The statement is not just a clear indictment of what this person saw as the values inherent in Facebook's new designs, but acknowledgment that there in fact *were* values that were guiding those

designs. This is no small thing, as technology is often easily seen as "value neutral," despite the old saying about what happens when you only have a hammer.

Empowered participatory practices

This interpretative space of critical mind-sets in which individuals "read" the "text" of the Facebook platform in order to uncover values and design implications can be seen as the basis for the wide range of empowered participatory responses to the situation. Three categories of advocacy and action showed up in the data I examined: advocating individual actions, voicing alternative designs, and advocating collective actions.

On the individual level, many felt that it was the responsibility of the user to respond to the situation accordingly, either by not posting certain things in their Facebook profiles if they wanted to keep them private, or by educating themselves about the contours of the new privacy policies. Others argued for personal deletion of Facebook accounts. Some of these calls were sarcastic responses to others complaining about the new policies and were of the "if you don't like it, why don't you leave" variety. Others, though, were from individuals who had essentially decided to boycott a service that no longer lined up with their values and intentions. All of these responses, at their core, were somewhat representative of libertarian notions of civic engagement, wherein the individual citizen, given freedom and choice, can determine her own destiny according to her values, and avoid things that are undesirable or create her own means of response to them.

A second category of advocacy and action was aimed at creating alternative models that Facebook might follow in order to become better aligned with what their users might want, such as this suggestion for how Facebook should reconfigure its privacy settings: "I'd like to see Facebook adopt a much more simple model:—Share with my Friends.—Share with Friends of my Friends.—Share with everybody. If you want to go crazy granular on settings under those buckets, great. But at least at a high level I can choose one of 3 things and feel mostly comfortable. That's enough for most users" (Chad Whitney, posting on Mashable.com).

Most common was the suggestion that Facebook should adopt an "opt-in" model when making changes to the kinds of information that can be shared. Rather than defaulting users into settings that made their information more rather than less public, a practice that Facebook has engaged in on numerous occasions (boyd & Hargittai, 2010), many suggested that Facebook make these possibilities available for people to choose to opt into if they so desired.

These sorts of design suggestions evidence a different notion of agency and understanding of the possibilities for reconfiguring sociotechnical spaces than those individuals who suggested that users educate themselves on the new policies or just

leave Facebook. One can imagine these suggestions emerging from the experiences of individuals who had encountered a wide range of changes to Facebook prior to this one. They understood that Facebook was completely capable of implementing new designs, and via their suggestions these individuals in some respects positioned themselves as advisers to Facebook's architects, or as advocates exerting public pressure for specific policy decisions and self-regulation on the part of Facebook.

Finally, numerous individuals voiced the need for collective action to explicitly exert pressure on Facebook to change how it operated. Many of these had less implicit trust in Facebook's ability or desire to self-regulate than those who suggested alternative policies and designs. Common in this category were calls for governmental regulation, mass exodus from Facebook, and suggestions that users collectively join sites deemed more respectful of privacy. The individual below advocated for a group action that displayed a deep understanding of the underlying market logic on which Facebook operates: "We are taking the fight to Facebook. We know how the info game is played, so every week we're going to change a detail on our Facebook profiles en masse to throw off their marketing data" (Amy Stein, posting on Mashable.com).

The collective actions more often seemed to align with somewhat traditional notions of community organization and nodded to the use of online civil disobedience, to desires for regulation of powerful entities and to treating Facebook like a traditional utility such as electricity or telephones with all of the implications for consumer rights that come with those assumptions.

These varied responses, on the level of individual action, design recommendation, and collective action serve to complicate what hacker literacies can look like when enacted in practice. There is clearly not only one response here that qualifies as empowered. Rather, underlying the differences in these responses were a range of value systems, understandings of what it means to be empowered, and decisions about what an appropriate reaction to the situation was. At the core of each of them though is a notion that there is something that can be done in the face of a sociotechnical space that is misaligned with one's values, an idea central in distinguishing hacker literate practices as ones that are not only critical but also participatory.

New media as a means of change

On analyzing the data, a final unique property relating to hacker literacies became clear: the fluidity with which the technological tools and spaces moved back and forth from norming user behavior through their designs to being themselves the very means of changing those designs. I saw examples of people first understanding that Facebook was now norming their behavior in some way, but then saw others who used Facebook as an organizing tool to advocate for changes. In the example noted

earlier of a woman who advocated large groups of people changing profile information to "throw off their marketing data," a link was shared to a page that had been set up on Facebook to coordinate these efforts. Others again shared more individualistic approaches to using Facebook as a means of resistance: "In my profile all my 'about me' fields now contain: 'As protest to Facebook's constant change in privacy rules, I have removed this field'" (Dude, posting on Techcrunch.com).

Facebook, though, was far from the only new media tool that individuals were employing to share, seek, or enact responsive strategies. Some people shared custom tools that had been created to make transparent what information was currently being shared, potentially inadvertently, by a Facebook user: "Lots of tools emerging now to turn the balance of power back to consumers. Here's ours, for FF and Chrome users who want to change settings to 'Friends Only' and keep them there— http://onebuttonrule.com/ Gets to *all* settings, works *automatically* to react to Facebook's changes" (Ginsu, posting on Mashable.com).

During the month that followed Facebook's F8 announcement, tools like this spread widely on the web. Reclaim Privacy, a tool recommended by a user commenting on Techcrunch, provided an open-source method of providing awareness of Facebook user-privacy settings. The designers of this tool were quite explicit in wanting to create a technical response to Facebook's changes that embodied the values they saw missing in Facebook itself:

> Our privacy policy is not long:
>
> - we **never see** your Facebook data
> - we **never share** your personal information
>
> Simple. After the scanner is downloaded from reclaimprivacy.org, it operates entirely between your own browser and Facebook. (ReclaimPrivacy.org. Retrieved May 2011)

At the time of this writing (December 2011), the Reclaim Privacy tool had been shared using Facebook's own "share page" feature more than 271,000 times.

Taken in a broader context, people's responses to Facebook's privacy changes in spring 2010 are notable for a number of reasons. Most significantly, they resulted in a shift in the way Facebook was formulated: in May 2010 Facebook introduced a "simplified" privacy interface (Zuckerberg, 2010). And while this response on Facebook's part can be problematized as one that in the process also removed the ability to restrict certain kinds of data from public view (boyd & Hargittai, 2010), the overall ecology that emerged as a result points to a culture that is characterized by both participation and criticality. Projects like Diaspora, an open-source decentralized social network, were supported by many in the technology world and elsewhere (Baio, 2010) who saw problems with Facebook's behavior and sought an alternative that respected their privacy. Others, like YourOpenBook.org, sought to

promote awareness of the vast amounts of personal information Facebook made public through its changes by creating a site that allowed public Facebook status updates to be searched. The launch of Google+, a privacy-conscious social network created by the search giant, was seen by some as responding to many of the critiques people had of Facebook in terms of the ways it deals with privacy issues. Finally, a settlement between Facebook and the Federal Trade Commission in November 2011 required the company to be subject to a number of checks around privacy issues including regular privacy audits until 2031 as well as requiring many privacy changes to be opt-in by users, as opposed to imposing sharing by default (Sengupta, 2011). These and other examples of mobilization and response are all indicators that the kinds of critical and participatory mind-sets evidenced in the data were also found more broadly.

The Origin of the #Hashtag

Despite the case of the Facebook privacy debacle, an oppositional relationship between users and developers is not a prerequisite to hacker literacies, something well illustrated by the case of the hashtag on Twitter.

In August 2007, an open-web advocate named Chris Messina posted a proposal for how people might self-organize on the microblogging social network Twitter using "hashtags," pound signs followed by a distinct signature that were placed at the end of posts on twitter (Messina, 2007). By early 2010, this was a common social practice used by millions of Twitter users from around the world to participate in wide-ranging conversations relating to real-world events and to organize around important issues (Carvin, 2009; Gannes, 2010).

Hashtags gained positive public attention during the "Arab Spring" of 2011, when a series of revolutions, some successful, some less so, broke out across the Arab world. The posts associated with Hashtags became sources for mainstream news media, including #Jan25, the date when protests broke out across Egypt that eventually led to the downfall of the Mubarak regime, and #sidibouzid, which referred to the town in Tunisia where its equally successful protest movement started.

What is unique here aside from the incredible organizing power that hashtags have is that the hashtag itself was a "hack" of Twitter. Chris Messina didn't work for Twitter; he just saw a tool that wasn't meeting his needs and values, and he proposed a solution and started to use it. His understanding of both the technical dimensions of search and the social dimensions of the needs that people had on Twitter led to an innovation that had mass public appeal. This also leads back to the point that hacker literacies are implicitly sociotechnical in nature in that Messina's hack could not have been achieved solely through a technical understanding of Twitter's fea-

tures, nor would he have been able to come up with this innovation if he were only attuned to social behaviors and needs and not to the technical formulation of the medium. Like the spaces it aims to affect, hacker literacies involve understandings and practices of both the technical and social variety.

While it is important to note that Messina did not have an oppositional relationship with Twitter (he merely saw that there was a way that it could be better aligned with his values around group organization), equally important is Twitter's response to this and other innovations that have emerged from its community: it embraced them. Part of why Twitter might have been more likely to respond in this way has to do with its comparatively pared-down design when placed next to a platform like Facebook, which has a much more robust and complex feature set. At the same time, Twitter's ability to adapt according to the values and innovations users bring to it points to a potentially supporting trend when it comes to hacker literacies: the iterative and responsive culture of "Web 2.0."

In general, the diverse ecology of the Internet has made web developers much more attuned to user experience and desires as a key factor in determining features. With a potential competitor a click away, participatory websites are often in "perpetual beta," an environment where untested features are regularly rolled out and users are treated as "co-developers" (O'Reilly, 2005). On a technical level, the features are relatively easy to change, and so on a social level, a culture of responsiveness to user desires has developed. At the same time, we cannot conflate wanting a better widget on the part of the user as wanting a participatory experience that embodies the values they want to live by, as so often more base desires for ease and function overshadow living according to more deeply held values.

If the case of Twitter and hashtags points to the cultural aspects of Web 2.0 that make it receptive to practices associated with hacker literacies, then the case of Facebook might point us to some of the challenges to hacker literacies that come up as a result of engineering culture. As Flanagan, Howe, and Nissenbaum (2008) note in "Embodying Values in Technology," the part of the academy that is most developed in engaging in systemic reflection about values is the humanities. They note that while computer science, design, and engineering programs can draw on lessons from those disciplines, these sorts of reflections are not central, and designers can often experience the limitations of their training. The case of Facebook's privacy practices itself was construed by some as resulting from engineers in that company who were "tone deaf" with regards to what users' values were, which alludes to this broader point about the limitations of technical culture's ability to reflect on values at play in designs.

We can look at Twitter, with its embrace of the hashtag as well as other user-generated practices that have affected the design of the platform as a case where the

designers of a sociotechnical space actively valued the priorities of their users and responded to user innovation accordingly. The degree to which a "hacker-literate" individual such as Messina is able to reformulate a medium according to his values is not only dependent on the depth of his understanding and innovative nature of his actions, but also on the culture within and surrounding a given sociotechnical space and how that affects its technical makeup and social landscape.

"Grid unification" and teen protest in a virtual world

For the final case, I return to a previous life, one where I would stay late at work, after all my other colleagues had left for the day, to explore vast landscapes with people from around the world. Occasionally I would go skydiving into an active volcano with a young man wearing a Godzilla costume. If my boss stayed late too, we would sometimes get into snowball fights, no matter what time of year it was. I was working in the 3D, user-generated virtual world of Second Life, a space where the surreal was always possible, and if you could imagine it, you could build it—that is, if you had facility with the world's extensive 3D modeling and scripting tools. Alex Harbinger, one of the amazing people I had the fortune to meet in Second Life during my years working in this space, was a person with such skills.

Alex was not only talented at creating complex virtual objects and landscapes, but in the time I knew him, he also created an empire. Harbinger Industries was Alex's "in-world" business. It sold any variety of virtual goods including clothing for "avatars" (the physical character of Second Life residents) to wear, accessories such as virtual paintball guns and grappling hooks, and games that could be set up on virtual properties and played by groups of Second Life residents that congregated in these spaces. His goods were not just sold in the virtual shopping centers that could be found on the more commerce-oriented areas of the virtual world; eventually Alex himself set up a number of virtual islands (the largest unit of land available for purchase within Second Life) where he both set up shop and also rented space to other entrepreneurial residents. These "sims" (in-world parlance for islands) not only made Harbinger Industries into a sustainable business, they also became extremely popular areas where people would gather not just for commerce but also for socializing.

There are a couple of details that I haven't mentioned yet though: Alex accomplished all of this by the time he was 15 in what may have been the world's only teen-run economy. In Second Life, those between the ages of 13 and 17 did not have access to the adult-only "Main Grid." Instead, they were restricted to the "Teen Grid," a much smaller collection of "sims" with a decidedly *Lord of the Flies* feel. I was working as one of the few adults cleared for access to this space. As an educa-

tor at Global Kids, a New York–based nonprofit that focuses on international affairs and human-rights education, I was part of a program within our organization that aimed to leverage new media in innovative ways to achieve our mission, hence my involvement in the Teen Grid of Second Life. As an adult, I was restricted to the "sims" that my organization owned, never able to visit the "mainland" of the Teen Grid, but I interacted with many teens who turned out for a range of workshops, camps, and competitions that we ran over the years. It was in this context that I got to know Alex, and his political views about the issue of "grid unification."

While some of the Teen Grid population enjoyed having their own space within Second Life, others felt that the separation of the grids was a problem. The teen population and physical land-space of the grid was small, and many residents felt like it was a less dynamic space than it could have been. Many complained that the economy was depressed. More than any of these, there was a strong sentiment that next to the Main Grid where the adults were located, those on the Teen Grid were treated like second-class citizens, and were subject to a form of age discrimination.

This is where "grid unification" came in. The idea could be considered by some to be the first age-based civil-rights issue in a virtual world, and by others to be an unrealistic pipe-dream put forth by naïve young people who didn't understand the issues at play in designing complex online communities. In its essence, grid unification was about creating a common space between the main and teen grids where parents could hang out with their kids, where teens could engage in commerce with a much larger market, where adults could mentor teens, and where teens in turn could showcase their creativity for a larger world. The teen-only space of the Teen Grid would be maintained, and "mature" areas of the Main Grid would be off limits to teen residents. The idea was essentially to create a bridge that would "unify" the two grids of Second Life.

"Imagine a world free of segregation, a world without discrimination—A world that we live in? Not quite, but the goal is within our reach. Grid unification is the first step—one to remove unneeded censorship and age discrimination. A movement that benefits everybody." These are Alex's words, which preceded a public debate he held on Global Kids Island in early May 2007 (Harbinger, 2007). When I asked him about grid unification for this chapter, Alex told me that it wasn't his idea originally. "It was a communal thing—we didn't want to be the small 1 percent. We wanted to be part of the whole thing. The idea of unification was floating around, but nobody was really doing anything." Alex decided that something should be done, and in the process created a movement.

In a 20-page document titled "The Grid Unification Proposal" that circulated around the Teen Grid in mid-2007, Alex artfully outlined his vision for unification. It was a proposal aimed directly at Linden Lab, the company that owns and runs Second Life. It outlined what unification would look like, how potential legal and

social issues would be mitigated, and included potential alterations and additions to the proposed policies that could be taken under consideration. He even included a Q&A section that addressed major questions that both adults and teens had raised about the idea of unification. Staff members at Linden Lab at the time reported to me that the document was influential during internal discussions regarding the issue, and was printed out and hung in the offices of those responsible for the Teen Grid.

More than that, the proposal was the articulation of a larger civic movement that had developed around the idea of unification. In early May 2007, following the initial release of the document, Alex organized hundreds of teens to participate in a non-violent protest walk called "The Walk for Intergrid Commerce." A version of the Grid Unification Proposal that was updated after the walk reported on it:

> After months of planning, Teen Grid residents organized and commenced a grid-wide walk to promote Grid Unification and cross-Grid commerce. The Walk took place on May 6th, 2007 officially starting at noon and ending near 1:30 PM. The walk consisted of hundreds of residents gathering to join in a non-violent walk across the Teen Grid.

What is so amazing about this story is not just that it is a powerful example of teen civic engagement, but it is that these teens couched their desires around the reformulation of a communications medium using the language of rights, discrimination, and censorship. Hacker literacies were implicit in their behaviors the entire time. To them, Second Life was not "just a game," a derisive jab commonly aimed at the virtual world, but a valid social and cultural space in which they could engage in acts of self-determination.

At the same time, they also held robust debate about the technical affordances of the medium, the potential social implications of varying governance policies and how the medium's current formulations were implicitly biased in certain ways. And they assumed that these were things that could be changed.

Conclusion

Beyond these examples, the broader world and current digital literacy movement both offer a lot to be hopeful for in terms of the development of hacker literacies. The rapid pace of technological change is beginning to make the malleability inherent in all technologies more transparent. Just as media watchdog groups and ombudsmen emerged as important voices in the broadcast media space, strong voices in mainstream media, academia, the blogosphere, and civil society are emerging to ask important questions about the ways that technology is formulated and how that affects society. More importantly, there are many burgeoning subcultures

that youth are already involved in including the game modding, DIY, and "Maker" spaces that place a high value on tinkering with, customizing, and pushing back against existing designs to create what one wants.

Likewise, increased interest in digital literacies and design thinking within the education community will likely be a boon for the development of hacker literacies. More and more projects, especially those oriented towards Papert's Constructionist learning principles, are aiming to position youth as designers of technology using tools like Scratch (Resnick et al., 2009), Gamestar Mechanic (Salen, 2007), Mozilla's Hackasaurus, and many others. Projects like these have strong potential to develop fundamental building blocks of hacker literacies, and put young people in the role of creators and makers of their own technosocial world. As a society, we need to be prepared to let that happen.

With appropriate development, critical participation with popular new media tools can come to occupy a similar space within participatory culture as has been filled by critical voices in other mainstream concerns. In the domain of consumer apparel, a movement of fair-trade-oriented consumers ask where, how, and by whom something is made, and with those answers are then empowered to make choices that affect the lives of others who lie at the other end of the supply chain. That example, however, serves as cautionary as well, as we still live in a world where exploitative labor practices associated with clothing manufacturing are rampant. While I believe participatory culture cannot, by virtue of its many-to-many structure, be completely dominated by one player, interest, or type of interactive approach, without incorporating critical practices into participatory ones, without the development of hacker literacies, people may find themselves living in a digitally mediated culture dictated by interests other than their own.

ACKNOWLEDGMENTS

NOTE

1. Those within the computer programming world apply the word "crackers" to those who use technological knowledge and skills for ill intent. Alternatively, these individuals are referred to as "black-hat hackers" in contrast to "white-hat hackers."

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