THE PARTICIPATORY WEB

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A user perspective on Web 2.0

This paper makes three contributions: first, we suggest a clear, concise definition of Web 2.0, something that has eluded other authors, including the Tim O'Reilly the originator of the concept. Second, prior work has focused largely on the implications of Web 2.0 for producers of content, usually corporations or government agencies. This paper is one of the few analyses of Web 2.0 from the point of view of users. Third, we characterize the creative activity of Web 2.0 users. In addition to their active content production, they are unusually active users of the Internet for entertainment. In multivariate models predicting Web 2.0, the most consistently important variables are technical ability, comfort revealing personal data and, particularly, Web 2.0 confidence. These variables suggest that despite the apparent simplicity of FaceBook or of typing a book review on Amazon, ability remains very important in the eyes of users. For many, there appears to be something daunting about contributing to Web 2.0 activity and many potential users remain, rightly or wrongly, uncertain of their ability to make a contribution. We conclude that the study of Web 2.0 can tell us much about how the Internet is unique, and that it warrants a significant scholarly attention.

In the past decade, it has become common to view the Web as more than a source of information, but as a place where ordinary people can contribute content via blogs, customer reviews, or other public postings. This is the idea behind Web 2.0 and it has been a striking business success, but why is it worth an academic study? Web 2.0 has introduced a new dimension to the Internet. It opens opportunities for participation by ordinary users; they can become producers of content in a way that is impossible without the Internet. In a sense Web 2.0 is the antithesis of the mass society model (Rosenberg & White 1957) of mass media that has dominated Western societies for the past 150 years. Production of most content has been dominated by large organizations with high-speed

production processes and widespread distribution.[1] The production and distri-
bution processes required large amounts of capital so that they were available
only through large organizations such as newspapers, book publishers, music
labels, film studios, radio, and television networks. The magnitude of the
change from a mass society model to a personal production and distribution
model underlines the importance of Web 2.0.

We shall argue that Web 2.0 takes advantage of many of the inherent charac-
teristics that make the Internet different from other communication media. Web
2.0 is an answer to the question: How is the Internet different? This fundamental
question is worth scholarly attention.

How exactly is Web 2.0 different? The definition of Web 2.0 is notoriously
difficult. Tim O'Reilly originated the concept with Dale Dougherty not as a
version number, but as a reference to the rebirth of the web after the dot-
com bust (O'Reilly & Battelle 2009). He observed that many survivors of the
bust had common characteristics that he summarized using seven 'principles':
(1) 'The Web as Platform'; (2) 'Harnessing Collective Intelligence'; (3) 'Data
is the Next Intel Inside'; (4) 'The End of the Software Release Cycle'; (5) 'Light-
weight Programming Models'; (6) 'Software Above the Level of a Single
Device'; and (7) 'Rich User Experiences' (O'Reilly 2005, 2007). These prin-
ciples mix software design strategies ('above the level of a single device') and
design goals ('rich user experiences'), programming advice ('lightweight pro-
gramming models'), and a hoped-for outcome ('harnessing collective intelli-
gence'). Such a mixture of strategy, goals, implementation, and possible
outcomes has no obvious theme. No wonder many have had trouble understand-
ing Web 2.0. Others follow O'Reilly's definition and they share a similar lack of
clarity (e.g. Miller 2005; Alexander 2006; Chadwick 2009). We suggest that
their difficulty stems from their approach. O'Reilly and others are oriented
toward businesses and other large organizations that produce content. Taking
a producer perspective makes sense because there are a lot of complex issues
to deal with, and that complexity is reflected in the list of principles. But we
can clarify the central theme of Web 2.0, if we approach it from a different
angle: the point of view of the web user.

From a user point of view, Web 2.0 has two primary components. First,
Web 2.0 takes advantage of 'network effects', the idea that some things are
more valuable when more people participate. Email is a good example. If you
are the only person with email, it is not very valuable. But as more people
have email, it becomes more likely that you can send a message to the next
person you want to reach. Thus, your email becomes more valuable. Compared
to the offline world, on the Internet network effects are enormously easier to
achieve.

Network effects are based on software such as Facebook, Twitter, Google
groups, or Meetup that lowers the cost of participation in a common activity.
This is the second component of Web 2.0 that we shall call the 'platform':

platforms create simple, reliable environments where users can do what they want. Platforms include user-created data supplied in the form of photos (e.g. Flickr), videos (e.g. YouTube), blog entries (e.g. WebRunner), product reviews (e.g. Amazon), and reviews of services (e.g. Angie's List) or mash-ups. Providing the right platform can create very large businesses.

The two components are closely related: There is the structure, provided by the platform, and there is the network effect, which emerges if large numbers of people find the platform valuable. Combined they create new content and much more, including new forms of user engagement, communication, and infor-mation gathering. We define Web 2.0 as: *Using the Internet to provide platforms through which network effects can emerge.*

Linking the spread of platforms to the creation of network effects is a way to understand some of the most successful and disruptive stories on the Internet. Using music sharing websites like iTunes or Spotify, ordinary users can find and distribute music much more easily than record labels, causing well-known disruption in the recording industry. Individuals can take advantage of platforms and network effects to create or find groups of like-minded people using Meetup or Google groups. This has social functions as well as political and commercial implications: the radical reduction in the cost of organizing simplifies collective action. The Arab Spring of 2011 is widely attributed in part to the ability of people to organize political action using platforms like Twitter and Facebook. In addition to forcing government and old businesses to change the Internet has another side: new businesses created by building platforms. Some are non-profit corporations like craigslist.com, but others are large commercial organiz-ations like Google. Successful corporations have been able to harness platform and network effects to create large, profitable businesses in just a few years. These brief examples address a core distinction between the Internet and the offline world. On the Internet platforms are much easier to create.

But it is not enough to create a platform; users must adopt the platform in sufficient numbers for network effects to occur. The history of the Internet is littered with the corpses of companies that built platforms that were supposed to become the Next Big Thing. User adoption is central but difficult to anticipate. No one, including their founders, anticipated the astounding success of Face-book, Google, or Twitter. This raises a central point that has often been over-looked in the producer-focussed, large-organization-oriented research on Web 2.0: *If Web 2.0 is about getting users engaged, who are Web 2.0 users and what do they actually do?* Despite the success and importance of Web 2.0, as far as we have been able to determine there is little prior work on actual Web 2.0 users.[2] This paper begins to fill that gap by discussing how users participate in Web 2.0. An additional uncommon contribution is that we use actual data, rather than just theorizing about Web 2.0. The remainder of this paper surveys prior literature on Web 2.0. We then summarize our dataset and the variables we will use. In the data analysis we first identify Web 2.0 users and

describe their empirical characteristics, followed by a multivariate model predicting who are Web 2.0 users. The paper concludes by discussing future research on Web 2.0 audiences.

Prior work on Web 2.0

Since most prior work on Web 2.0 has been based on producers, it can be categorized according to the field of the producer. Amongst others, there are studies in seven fields: politics (e.g. Granick 2006; Mejias 2008; Chadwick 2009) health care (e.g. Giustini 2006; Kamel Boulos & Wheelert 2007), education (e.g. Alexander 2006; Anderson 2007), computer science (e.g. Van der Vlist *et al.* 2006; Feiler 2007; Segaran 2007; Crumlish & Malone 2009), and geography (e.g. Goodchild 2007; Howe 2009). We summarize the two larger areas, business and libraries below. Studies in the other five areas are similar in focus and summaries would be redundant. We then summarize the (few) broader studies of Web 2.0 users.

A large number of publications on Web 2.0 focus on business and how to make use of the new Web 2.0 applications to boost businesses (e.g. Hoegg *et al.* 2006; Funk 2008; Bernal 2009; Lytras *et al.* 2009; Rice Lincoln 2009; Sankar & Bouchard 2009). The titles mostly encourage small-scale businesses to introduce Web 2.0 applications that helped larger businesses, such as Amazon, or eBay, to become so successful. The key word seems to be user participation; however, none of these publications put the user perspective into the focus of their work. One of the first and primary articles in this area is O'Reillys' (2007) identification of the principles of Web 2.0 summarized above.

Miller (2005) and Maness (2006) discuss how libraries, publishers, and other companies in the publishing sector should make use of Web 2.0 to enhance their services: 'Library 2.0 is a mashup. It's a hybrid of blogs, wikis, streaming media, content aggregators, instant messaging, and social networks' (Maness 2006). Anderson (2007) describes how collection and preservation activities within libraries can be enhanced by the use of Web 2.0 applications. Other publications discuss the challenges and opportunities of Web 2.0 applications for libraries (e.g. Bradley 2007; Cohen 2007; Godwin & Parker 2008; Parkes & Hart 2010).

Several publications have tried to grasp the whole Web 2.0 phenomenon, focusing not only on the characteristics of the 'newly born' web, but also on implications for society, businesses, and other realms of everyday life. The Organization for Economic Co-operation and Development (OECD) described two main principles of Web 2.0 in their publication 'Participative web and user-created content', defining the two terms and looking at drivers, types, and outcomes of these developments (OECD 2007). A specific focus lies on economic and social impacts as well as opportunities and challenges for users, business and policies, such as property rights, digital rights, taxation, and security. Once

again, this is not a user-focused perspective, and we will not summarize it in more detail.

Several articles discuss participatory aspects of Web 2.0 (Beer & Burrows 2007; Beer 2008, 2009; Harrison & Barthel 2009). All recommend an agenda for the study of Web 2.0 and they describe how this might be done using examples and case studies; none include systematic data collection or analysis. Consequently, they do not investigate the social characteristics of Web 2.0 users.

In summary, prior work on Web 2.0 has focused typically on organizational producers of content. There is little work examining how users actually interact with Web 2.0 platforms. For data, prior work relies on example and anecdote; no one uses systematically collected data.

Theory and Web 2.0: from mass production to production by the masses

Given the lack of prior work on users and Web 2.0, for a theoretical understanding of users we turn to other areas of research on Internet users. There is a small literature on content production. This literature typically does not mention Web 2.0, but it is relevant since the core of Web 2.0 is content. Web 2.0-style content production requires an additional set of Internet skills beyond searching, viewing, or reading. Web 2.0 often involves uploading or downloading files, with more complex knowledge of how folders are used and organized in the user's directory tree. Skills have repeatedly been shown to be related to online use (e.g. Livingstone & Helsper 2007; Hargittai & Walejko 2008; van Deursen & van Dijk 2010).

In the offline world, social class is strongly associated with content production and participation in cultural production (DiMaggio & Anheier 1990). Some, such as Jenkins *et al*. (2006) and Benkler (2006), argue that the Internet is different because it has very low barriers to participation. But Zillien and Hargittai (2009) and Schradie (2011) find that high-status people are more likely to engage in online content production. These studies suggest that the old core forms of stratification – usually measured by education and income – continue to be important on the Internet.

The literature on use or non-use of the Internet is relevant to Web 2.0, particularly discussions of skills, experience, and attitudes. One major conclusion of Dutton and Shepherd (2006) and Blank and Dutton (2011) is that the Internet is an experience technology. By this, they mean that '[t]hose exposed to the Internet gain more trust in the technology... Even past users have more confidence in the Internet than do non-users who have no experience' (Dutton & Shepherd 2006, p. 442). Web 2.0 can be a complex environment with a great deal of depth. Over years of use, people can gain additional competence, which may lead to additional willingness to explore more complex uses of the Internet.

We expect that more experienced persons tend to be more comfortable and more likely to use Web 2.0 technologies.

We also expect attitudes toward technology to be important in the use of Web 2.0. Attitudes represent broad receptiveness to technology. They influence the willingness of respondents to learn new aspects of a technology and the motivation to overcome problems. To this extent, they influence the sensitivity to risk and confidence about using technology.

This leads us to a model of Web 2.0 use with two categories of variables. Demographic variables influence Web 2.0 use through the presence of generalized resources like education or income. They indicate the presence of more free time (e.g. single) or less free time (e.g. married) needed to do the Web 2.0 content production. Some demographic variables, like age and lifestage, are relevant because they indicate the presence of an environment where the use of Web 2.0 is common (e.g. young, students) or unusual (e.g. older, retired). In short, demographic variables measure the presence or absence of facilitating environmental factors. A second set of variables measures Internet-related characteristics. These include personal attitudes, experiences, and skills. We treat these two categories separately in our models below.

Data and measurement: Oxford Internet Survey

The Oxford Internet Surveys (OxIS) collect data on British Internet users and non-users. Conducted biennially since 2003, the surveys collect a nationally representative random sample of more than 2,000 individuals aged 14 and older in England, Scotland, and Wales. Interviews are conducted face-to-face by an independent survey research company. The analyses below are restricted to the 73 per cent of the British population who are current Internet users in 2011, $N = 1,498$.

OxIS contains seven variables about common Web 2.0 activities: writing a blog, maintaining a personal website, posting on discussion or message boards, maintaining a social networking profile, uploading and tagging photos, uploading videos, or uploading personal writings, poetry or any other creative materials. While this list is not exhaustive, we believe that it captures major elements of Web 2.0 activity. These variables are measured using an identical likert scale, with six categories ranging from 'Never' to 'More than once a day'.

Among the demographic variables, preliminary analysis showed that the only important distinction in education was between people without any educational qualifications and people with some qualifications.[3] Race is coded as white versus non-white. Lifestage is a four-category variable coded ordinally by Web 2.0 participation: retired, unemployed, employed, and students. Marital status is also

coded ordinally by Web 2.0 participation: widowed, divorced, or separated, married, living with a partner, and single.

The Internet-related variables are usually scales. Prior research (Blank & Dutton forthcoming) has shown that the number of Internet-connected devices is related to content creation. We include a count of the number of Internet-connected devices available to respondents.

If the Internet is an 'experience technology', then experience includes negative experiences. Bad experiences on the Internet could influence willingness to engage in Web 2.0 activities. We include six negative experiences – SPAM, viruses, misrepresented purchases, stolen identity, requests for bank details, and accidentally reaching a porn web site – in a bad experience index with a Cronbach's alpha of 0.60.

Confidence in ability to do things that Web 2.0 requires can influence willingness to take risks to learn Web 2.0 activities. Five OxIS variables – confidence participating in an online discussion, confidence making new friends online, confidence downloading music, confidence uploading photos, and confidence in learning how to use a new technology – are combined into a Web 2.0 confidence scale with a Cronbach's alpha of 0.90.

Certain popular Web 2.0 activities, especially social networking sites and writing blogs, require revealing personal details about yourself that may allow others to identify you. If participants find this risky, they may be deterred from participating. Five items – comfort revealing an email address, a postal address, a phone number, a date of birth, or a name – were combined into a personal data comfort scale with a Cronbach's alpha of 0.89.

Willingness to use Web 2.0 can be influenced by users' willingness to learn new aspects of a technology and their motivation to overcome problems. Six items – openness to new technologies, technology is making thing better, plus four reverse-coded items: it is difficult to keep up to date with technology, it is easier to do things without technology, lack of trust in technology, and nervousness around technology – measure general attitudes toward technology with a Cronbach's alpha of 0.75.

Data analysis

About 75 per cent of the Internet users participate in at least one activity. Figure 1 shows that participating in social networking is the most popular Web 2.0 activity drawing over 60 per cent of users; the least popular activities are posting poetry, writing or anything creative (15 per cent), and writing a blog (22 per cent). They may be least popular just because they are more difficult and time-consuming.

Figure 2 shows the number of activities each respondent participated in. Note two things: First, 25 per cent of all Internet users do not participate in any Web 2.0 activities at all, and this is the modal category. Second, the
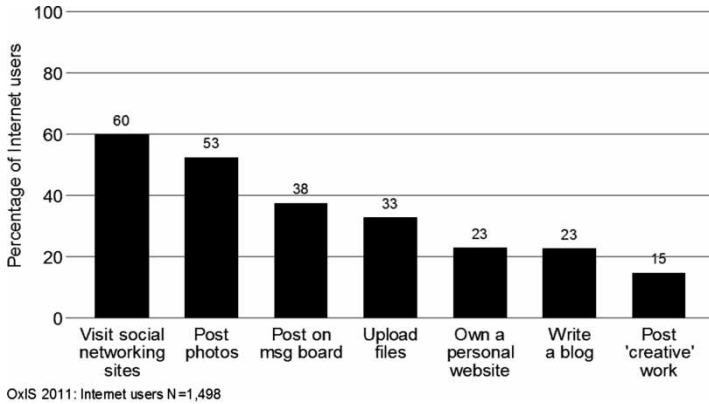
FIGURE 1   Participation in Web 2.0 activities.
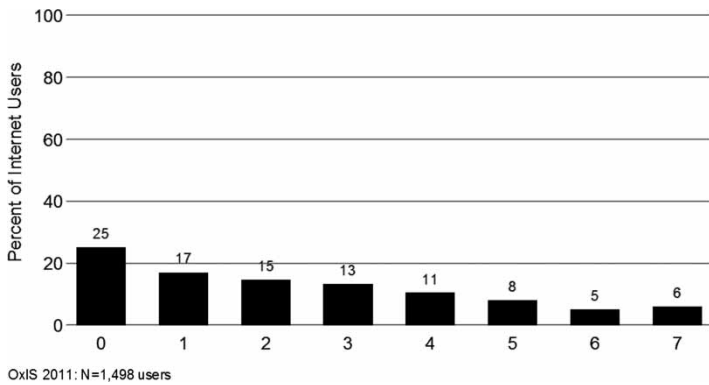
FIGURE 2   Number of Web 2.0 activities.

distribution of participation changes smoothly, tailing off almost monotonically
to the maximum of seven activities.

Figure 2 hints that the most important difference is between participation in
no activities and participation in one or more. This is confirmed by a detailed
examination of the 56 separate percentage tables formed by the eight demo-
graphic variables by the seven dependent variables. In each table where there
is a significant chi-square, the pattern of percentages in the 'Never' column is
distinctively different from the pattern in every other column. Table 1 shows
a typical example: in the 'Never' column, the highest percentage is in the
Retired category, followed by unemployed, employed, and students. In *all*
other columns, the order is reversed: retired are the smallest percentage and stu-
dents are the largest. Since 'Never' is always different, we lose little information
by dichotomizing the dependent variables into two categories: participating in
Web 2.0 versus never participating.

TABLE 1   Example table: lifestage by how often do you post messages on discussion boards (percentages).

	Never	Less than monthly	Monthly	Weekly	Daily	More than daily	Total
Students	42.4	15.2	12.6	15.8	10.5	3.5	100
Employed	60.8	13.3	7.2	10.3	7.1	1.4	100
Unemployed	66.2	11.4	5.6	8.4	6.8	1.7	100
Retired	84.4	7.4	2.5	5.3	0.5	0.0	100
Total	62.3	12.5	7.0	10.0	6.7	1.5	100

If we define Web 2.0 users as respondents who participate in at least one Web 2.0 activity, then users are remarkably engaged in entertainment on the Internet. Figure 3 shows that they use the Internet for entertainment much more than non-users. They are 37 percentage points more likely to download music than non-users and they are 27 percentage points more likely to listen to music over the Internet. Except for gambling, Web 2.0 users are more likely to do each of the activities in Figure 3 by at least 25 percentage points. 32 per cent of Web 2.0 users say that the Internet is an 'essential' source of entertainment compared to 16 per cent of non-users.

The classic Web 1.0 use of the Internet is information search. Do Web 2.0 users take better advantage of information resources than Web 1.0 users? Figure 4 compares information seeking in Web 2.0 and non-Web 2.0 users. In general, Web 2.0 users are more likely to use the web as an information resource. The difference for most categories is less than 10 percentage points; for example, travel, news, and health information. Compared to entertainment (Figure 3) the striking message is that Web 2.0 users are not that
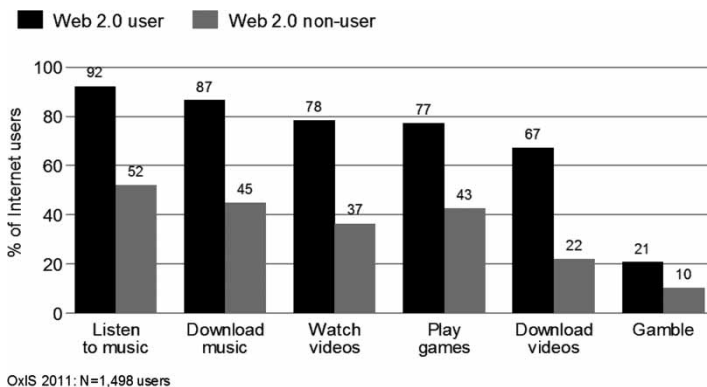
FIGURE 3   Web 2.0 and entertainment used of the Internet.
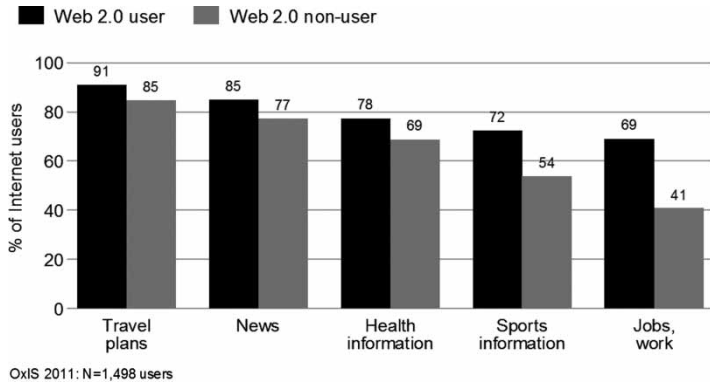
FIGURE 4   Web 2.0 and information seeking on the Internet.

different from other users. Unusually high information use does not distinguish Web 2.0 users.

Predicting the use of Web 2.0: Multivariate models

We can capture the relative importance of the characteristics of Web 2.0 users in multivariate models, see Table 2. We use logistic regression models with two categories of variables, demographic variables as controls and Internet-related variables. The dependent variable is always a dichotomous variable where zero indicates no use and one indicates use.

We discuss first the seven models with only demographic control variables.[4] Based on the odds ratios, age usually has the strongest influence. It is the only variable that is significant in all seven demographic-only models and it shows an unsurprising inverse relationship, meaning younger people participate in more Web 2.0 activities. Three additional variables are significant in more than one model: education, gender, and marital status. Several things are notable about these variables. First, since the omitted categories of both student and single are strongly related to age, once age is controlled the effects of marital status and lifestage participation weaken. Although age is the strongest variable, it is far from the whole story. Education increases Web 2.0 participation in three models, while lifestage and marital status are significant in two models. It is not surprising that age, marital status, and education influence Web 2.0 participation, but it is surprising that ethnicity and income have no effect on any dependent variable.

Finally, being female reduces participation in blogging and uploading files, but it increases participation in social networks. It is the strongest variable in the social networking model mirroring the fact that women are more likely than men to do social networking (Dutton & Blank 2011).

TABLE 2 Predicting Content Creation (Logistic regression results showing odds ratios).

Dependent variable Variable	Maintain a personal website		Write a blog		Upload creative work		Use social networking sites		Post messages on discussion boards		Upload pictures		Upload files	
	Demog.	Internet-related	Demog.	Internet-related	Demog.	Internet-related	Demog.	Internet-related	Demog.	Internet-related	Demog.	Internet-related	Demog.	Internet-related
Age	0.98**	11.00	0.97***	0.99	0.97***	0.98*	0.95***	0.97***	0.97***	0.99	0.97***	0.99	0.96***	0.98***
Marital Status	1.06	1.03	1.14	1.13	1.18	1.2	1.44***	1.52***	1.12	1.13	1.22*	1.26**	1.06	1.05
Lifestage	1.17	1.01	1.09	0.96	1.11	1.05	1.40**	1.29*	1.12	0.97	1.22	1.11	1.38**	1.28
Education	1.41	0.97	1.04	0.65	3.53**	2.67*	1.26	0.91	1.96**	1.39	2.10***	1.67*	1.52	1.06
Gender	0.82	1.1	0.65**	0.85	0.91	1.1	1.67***	2.57***	0.89	1.22	1.06	1.61**	0.50***	0.64**
Urban	0.96	0.94	1.24	1.3	2.64*	2.87**	1.30	1.19	1.30	1.33	1.08	0.95	1.48	1.56
Income	0.93	0.82**	1.00	0.92	1.00	0.99	0.92	0.84**	0.96	0.84**	0.99	0.92	0.95	0.90
Race	1.12	1.11	1.52	1.58	1.24	1.18	1.16	1.20	0.83	0.69	0.72	0.74	1.00	1.02
Technical Ability		1.74**		1.76**		1.47*		1.14		1.50**		1.06		1.46**
Bad Experiences		0.81**		0.95		1.10		1.10		1.00		1.01		1.04
Technology Attitudes		1.01		0.99		0.92**		0.98		0.96		1.00		0.99
Personal data Comfort		1.06*		1.07**		1.01		1.02		1.04		1.04*		1.01
Web 2.0 Confidence		1.10***		1.09***		1.13***		1.16***		1.16***		1.17***		1.11***
N of devices		1.17*		1.11		1.02		1.06		1.21**		0.96		1.00
Constant	0.37	0.01***	0.43	0.01***	0.04*	0.01***	0.95	0.04***	0.57	0.01***	0.56	0.02***	0.64	0.02***
N	1044	1039	1047	1042	1043	1038	1050	1020	1044	1015	1047	1017	1041	1012
McFadden R^2	0.04	0.14	0.07	0.15	0.10	0.17	0.21	0.30	0.08	0.21	0.09	0.22	0.12	0.20

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$

Now we turn to the seven models that include both demographic variables and Internet-related variables. The additional variables have a major impact; in all but one case they double the pseudo-R^2. Several demographic variables become less important: notably age is now significant in only three models and its odds ratio weaker (closer to 1.0). Education is significant only in two models, but the odds ratios are very large, so it is the strongest variable in those models. Income has become more important: significant in four models, it is always less than zero, indicating that higher incomes reduce the odds of Web 2.0 participation. This is due to the fact that, for both students and unemployed, the lowest category of income (less than £12,500/year) is the most frequent category and it is also the modal category for the use of Web 2.0. Here Web 2.0 participation is in sharp contrast to most other Internet variables where, even without controlling for lifestage, higher incomes are associated with more Internet activity.

Looking at the Internet-related variables, the strongest variable is Web 2.0 confidence, significant in all seven models. We suggest that this is related to the nature of the Internet as an experience technology, where experience reinforces confidence and vice versa. If you have confidence, you are more likely to do it and if you do it successfully you gain confidence. Interestingly, technical ability is also important: significant in five models. On the surprising side, the number of Internet-connected devices is significant only twice, while technology attitudes and bad experiences are significant only once.

If we look at two-way tables when comparing Web 2.0 use with age or lifestage, we find not surprisingly that students and young people are most likely to use Web 2.0. We have not shown any of these tables deliberately because of the multivariate results. Once other variables are controlled, age and lifestage diminish greatly in importance (except for the models using social networking as the dependent variable). This underlines the fact that issues like Web 2.0 confidence and privacy attitudes seem to be consistently more important. These models indicate that older people or employed people who share the same confidence and understanding of privacy as the young use Web 2.0 to the same extent.

Discussion

One notable finding is the effect of age. Age tends to be important in all areas of Internet research. In our models, the effects of age weaken sharply when we control for the Internet-related variables. Age is an odd variable because it does not directly 'cause' anything, instead it is a proxy for many things that change with age, but it is often unclear exactly what it is a proxy for.

These results suggest possible mechanisms through which age could work. Older people may be less likely to participate in Web 2.0 because of the lack of Web 2.0 confidence or because of the lack of technical ability. This suggests

that – despite the apparent simplicity of Facebook or of typing a book review on Amazon – ability remains very important, at least in the eyes of users. This leads us to suggest that for many there is something daunting about contributing to Web 2.0 activity and many potential users remain, rightly or wrongly, uncertain of their ability to make a contribution. A second mechanism may be due to the need to reveal personal data. As scholars like Elias *et al*. (2010) and Morris and Venkatesh (2000) argue, older people may be less comfortable supplying the personal data required to maintain a website or write a blog, and this may also inhibit their willingness to engage in Web 2.0 activity. Finally, the issue many not be age so much as comfort with the way they live their lives. Older adults may feel satisfied with their activities just as they are. Changing a long-established, comfortable, full lifestyle that serves them well in order to devote the time and effort needed to add content to the Internet may not offer attractive benefits. This could apply to others who feel they lead a comfortable life.

Web 2.0 users' commitment to content production and their disproportionate use of the Internet for information seeking are both task-oriented activities. In contrast, their disproportionately high use of the Internet for entertainment has little to do with task achievement. What ties the use of the Internet for entertainment with Web 2.0? We suggest that this links to the importance of confidence, specifically the relative lack of confidence of non-Web 2.0 users. For many non-Web 2.0 users, the entertainment uses of the Internet like playing games, listening to music, up- and downloading files, or gambling may have a significant technical component. They do not feel confident in their ability and this suppresses their use of the Internet for entertainment. An alternative explanation is a measurement error: Up- or downloading files is a frequent Web 2.0 activity. Up- or downloading texts, music, photos, and videos is categorized as entertainment. Thus Web 2.0 and entertainment uses of the Internet may seem to be associated simply because it is hard to disentangle them empirically.

The weakness of the technology attitudes variable is also noteworthy. Many have argued that young people have dramatically different attitudes toward technology than older people (e.g. Morris & Venkatesh 2000; Elias *et al*. 2010). Since Web 2.0 users tend to be young, we expected that attitude variables would be strong in our models. That is not the result we see. Perhaps attitudes are an epiphenomenon of more important issues. Our multivariate models hint at what might be more fundamental: confidence in Web 2.0 skills is a candidate. It is easy to see why Web 2.0 confidence could have a strong positive effect on attitudes toward technology. Although there is research on technical abilities (Hargittai 2002; Hargittai & Walejko 2008), samples are based on convenience and general technology attitudes are not measured. Much more research is needed into the complexities of the relation between competence, activity, and attitudes on the Internet.

An enduring puzzle of Web 2.0 is, why do it? Web 2.0 content production is time-consuming and largely unpaid. What is the payoff for writing a blog or a

product review? In some cases, the payoff is clear, such as NASA's 'clickworkers' (Marsden 2009), but that is unusual. Few scholars ask themselves why? Marsden (2009) speculates that 'Participation in crowdsourcing is motivated by a number of factors but they boil down to the 4Fs – Fame, Fortune, Fun and Fulfillment. Good crowdsourcing initiatives should offer participants a mix of all four Fs' (Marsden 2009, p. 26). While plausible, this speculation is not based on systematically collected data. More work is necessary on the question of how people understand their own production of content and their motivations. Better data are badly needed, and survey data are probably not the best kind. Ethnographic data are probably required.

The lack of scholarly work on Web 2.0 is a missed opportunity. Work on individual Web 2.0 platforms like Amazon customer reviews, Facebook pages, Twitter, file uploads or blog entries is valuable. What this research misses is the bigger context in which these platforms are situated. Despite the diversity of platforms, there are common elements across Web 2.0. For one, most contributions are public. This creates problems when typically private events come to public attention (e.g. Colmes 2011) or when events meant for one circle of friends are seen by someone else (like parents or employers). Another common element, as we show in Figure 3 above, is the unusually high use of the Internet for entertainment. A third common element is the consistently high level of confidence in Web 2.0 competence. These examples do not exhaust the list. Research is badly needed to understand what else is common to all Web 2.0 users. Findings of common elements across such diverse phenomena as customer book reviews, 140 character Tweets, and music file downloads would go a long way toward helping us understand what is unique about platforms with strong network effects. In turn, this may tell us more about why and how the Internet is unique.

Similarly, the sharp disjunction we found between Web 2.0 users and non-users begs further work. Before we saw these results, a plausible hypothesis would have been that there is continuum, where people who use Web 2.0 less than monthly would look more like non-users than like people who use Web 2.0 more than daily. One of the clear messages, consistent across dozens of tables, is that that is not true. People who make any use of Web 2.0 at all are different from non-users. Why? What is so different about the non-users?

The differences between Web 2.0 users and non-users raise a further question: As Web 2.0 becomes more deeply integrated into the Internet, what effect does this have on the non-users? If we are right that non-users tend to have fewer skills and be less confident in their skills, does this tend to cut them off from many of the strengths of the Internet, such as its potential to empower people by giving them a voice? To what extent is the emergence of Web 2.0 creating a new digital divide? If so, this is an important area for future study.

Notes

1   The historical argument in this paragraph is developed in many places, see Benkler (2006) for an example.

2   There are studies of individual platforms like blogs or Facebook. These studies do not see the larger Web 2.0 picture of which their platform is one part. We return to this issue in the discussion, below. More to the point, many of these studies are not interested in the platform itself, but in some other issue – e.g. networks on Facebook – so the platform is the research site rather than the object of the research.

3   This refers to the British educational system. An approximate American equivalent would be between people who did not graduate from high school versus people with a high school diploma or higher.

4   We also ran all models using dummy variables for the categories of martial status and lifestage. Models using this alternative specification showed no substantive differences.

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