



# An evolving gender digital divide?

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## Overview

This Issue Brief takes a fresh look at the factors surrounding what has appeared to be a closing of the gender divide among those using the Internet and other information and communication technologies (ICTs). Empirical evidence based primarily on the Oxford Internet Survey (OxIS) is used to identify key dimensions of 'access' whose measurement can help to reveal some detailed emerging differences in the ways choices are made in practice about whether or how to use the Internet.<sup>1</sup>

## Do digital divides still matter?

There has long been concern that a barrier to the emergence of an equitable information society will be created by the existence of digital divides—a difference in the take-up, or effective use of, ICTs between social groups or nations. This has led to a range of public policy measures, for example through infrastructure regulation and subsidized community provision in developed countries and by calls for funds to support diffusion in African and other countries with low Internet take up.

Critics of such policy intervention have pointed out that every new technology has been adopted first by richer nations and wealthier citizens within them. Over time, most technologies diffuse widely and the differences in ownership and use erode (Thierer 2000; Compaine 2001; Fink and Kenny 2003). If this argument is correct in relation to the Internet, it would be a waste of public money to intervene in a problem that will solve itself. Furthermore, it would distort the free market between producers of goods and services. It is worth noting that this line of argument is dependent on the (usually unexplored) assumption that such lagged adoption will not significantly exacerbate the position of disadvantaged social groups.

Such arguments, at first made rhetorically, are gaining strength as more data emerge. Some digital divides that caused concern only five years ago seem to be disappearing. The gender digital divide is the most prominent of these. Wherever data have been collected, early adopters of the Internet have been overwhelmingly male. However, data from the USA in 2002 shows no gender difference in Internet use (NTIA 2002). China, a country where Internet take-up is relatively recent, shows how rapidly change can occur. Over a five year period from 1997, the proportion of Internet users who were female rose from 12 to 39% (CNNIC 2002).

The alternative argument is that while the most obvious divide—the degree to which those using the Internet are demographically unrepresentative—may be closing, other more subtle divides are emerging. These relate to the quality of access, the

ability to use the Internet effectively and the way Internet use affects access to goods and services. These differences will be associated with patterns of advantage and disadvantage between social groups. Some see technology as a potential route out of exclusion, such as through access to jobs, and hence express concern that its absence will reinforce disadvantage. While most commentators are more circumspect about the degree to which any technology can, in itself, reduce poverty or other aspects of inequality, they nevertheless see its adoption as making a contribution to economic and social regeneration.

This Brief explores contrasting scenarios by examining gender differences in the UK, a country with relatively high Internet use and social policies to support its diffusion to socially-excluded groups. It is argued, using data from OxlS, that this case is important both in its own right, and for the light it can shed on wider debates about whether Internet use is affecting, and being affected by, social divisions.

### **Measuring 'access'**

Access is a social phenomenon. Before it can be achieved, one needs at least some sense of what the Internet is, why it might be of interest, what one can do with it and how you can achieve what you want using it. For most people, this is gained through social interactions with work colleagues, friends and family. Reading books, watching the television, listening to the radio and formal instruction may also contribute. Access is also a social phenomenon in the sense that, to be meaningful, Internet use needs to be integrated into one's day-to-day activities, be they finding train times, buying a holiday, communicating with a friend, carrying out one's job or simply passing leisure time. In doing so, it changes the nature of one's social interactions and relationships with social institutions. As Dutton (1999) observed, access is the expression of 'multifaceted interactions available through ICTs and how they shape access to information, people, services and technology' (p. 5), the nature of which varies in different social settings as it is formed through an interactive 'process of social and technical choices by many different actors' (p. 29).

Understood in this way, *technical access* (proximity to an Internet-enabled computer, mobile phone, television or other ICT device) is a necessary, but not sufficient, condition for access. It is, however, important in determining the quality of such access. For example, broadband provision can provide the opportunity for 'realistic' video-conferencing whereas mobile phones enabled with the Wireless Application Protocol (WAP) to access the Internet offer effective access only to a limited range of Websites. The social terms on which such access is available will also be significant. Is it in a library with limited opening hours or in one's home? Is the time one can use it limited through competition from other users and are the costs manageable? Are there restrictions on what the access can be used for, for instance through an Internet-use policy in a public facility or via monitoring for relevance to one's job in the workplace? These kinds of considerations create not one digital divide, seen as Internet provision or lack of it, but rather a 'continuum of connectivity' (Warschauer 2003).

A complex range of factors also affect a person's *ability to use access*. This is sometimes referred to as the need for appropriate skills. However, it is important to distinguish between knowing the techniques required (e.g. where to put the address in an e-mail)

and skill as social practice, which in this case involves learning how to communicate in a new way. From this latter view, people learn through increasing participation in a 'community of practice' where using the technology and sharing understandings about its significance for particular activities contribute to social learning (Lave and Wenger, 1991). As such, the ability to use available access, and ultimately the type of access achieved, can be affected by the social networks of which one is already a member and by those that exist at the place where one has access. It will also be affected by the complexity of what one is trying to learn; in the case of ICTs, this includes the characteristics of the software interface (van Dijk 1999).

Of course, having technical access and the ability to use it do not guarantee that an individual will actually use it, or if he or she does that it will have any great consequences for their lives. *Take-up of access* can be a temporary phenomenon, as people lose technical access or find they lack sufficient ability to use it. But it can also be the result of experiencing what the Internet has to offer and deciding it is not of sufficient value. There are also many sources of variation for people who do become established users, including the amount and range of use. Related to this, the *impact of access* will vary. It will change significantly the things some people do and the way they do them; for others, it will affect only certain very specific aspects of their lives. For some individuals and communities this impact will be economic, while for others it may be primarily about reducing social isolation.

A full understanding of these issues requires further in-depth qualitative research. Nevertheless, it is possible to shed some light on most of these dimensions using the quantitative measures identified in the above discussions, as summarized in Box 1 below and explored in the rest of this Brief.

#### **Box 1. Key dimensions of Internet access affecting gender divides**

- *Technical access*: where men and women can and do get access to an Internet-ready device; the type of device involved; and the quality of the connectivity.
- *Ability to use access*: the extent to which men and women know other people who use the Internet and can provide help; the skill levels they perceive they have reached; their comfort/discomfort with ICT-based systems; and worries about potential negative consequences of access (e.g. fraud or viruses).
- *Take-up of access*: whether men and women are Internet users; any variation in length of use; how much use they make of access; and what range of activities they use it for.
- *Impact of access*: the degree to which Internet use has changed patterns of activities; any views as to the significance of this, in this context focusing on the extent to which access is being used in ways that challenge or reinforce gender stereotypical behaviour.

### **Evidence from the UK illuminating gender digital divide issues**

#### *Technical access*

OxIS starts from a very broad definition of where a person could get access. This is based on whether a person lives in a place that is large enough to have a nearby

library, lives in a house with Internet access, is in full-time education or works in a place where they or someone else uses the Internet. By this definition, virtually everybody (96%) potentially has some form of access. Nevertheless, both potential home access and work access (the second and third most common sites) were significantly less available to women than men.<sup>2</sup>

In terms of the types of access devices available and their quality, OxIS data relate only to those who actually use the Internet. There is little gender difference in the form of access, with the vast majority of both male and female users (92%) saying that they used the Internet via a computer connected to a telephone line. This is of interest since alternative access devices, such as digital TV, have sometimes been suggested as a route to increase access for those who might be put off by the 'technical' image of a computer. If it was simply the means of access that was putting some women off using the Internet, one might expect to see greater usage of other devices by them.

The only difference among those who said that they had other devices was that slightly more men than women said they had WAP-enabled mobile phones. Since most new phones come with this facility (and the more expensive ones have for some time), this finding may simply be a reflection of men's greater purchasing power. The majority of male and female users had home access via a standard dial-up telephone line, although of the one in five of the sample with broadband access 55% were male.

When asked about the places where they actually went online, both men and women Internet users overwhelmingly cited their own home (mentioned more than three times as frequently as the next most common option, their place of work). However, there was significant variation by gender, with 92% of male current users saying that home was one of their places of access compared with 86% of women. This seems to be a reflection of the earlier observation that home was significantly less likely to be a potential site of access for women than for men, since only around 2% of users with Internet access in their home do not use it. Nevertheless, the mere presence of Internet access in one's home is insufficient to make a person a user. The survey found that about 10% of all those who did not use the Internet at all lived in a household with access.

These findings indicate the complexity, and significance, of the types of access identified in Box 1. If one takes the position that access consists solely of having an Internet-ready computer close by (*technical access*), then those who have such a machine in their home but do not use it can only be assumed to be making a positive choice against use. However, if one believes that (particularly new) access also requires a person to be in a supportive environment, to have appropriate skills and so on (*ability to use access*), then a machine in the same room might be as inaccessible as one five miles away. This latter view of access is supported by more detailed research on the way in which people become Internet users. Liff et al. (2002) surveyed 200 people who were in a public location offering Internet access but not using that access (e.g. drinking coffee in an Internet café or getting benefits advice in a community centre). For those who were not currently Internet users, 20% said they would be interested in becoming one, but needed more encouragement or support to do so.

### *Ability to use access*

Concern has been expressed that non-users are discouraged from starting to use the Internet by a range of anxieties, for example that they will encounter unacceptable content or may be the victim of financial fraud. The OxIS survey did show that women were more likely to think there was too much sex available on the Internet and considerably more women than men (69% compared with 55%) indicated that they had some concerns about the potential for receiving unpleasant e-mails. However, in response to more specific questions, users revealed little difference by gender in terms of, say, their attitudes to spam (with 29% of male and 31% of female e-mail users saying they received far too many spam messages) or in their experience of viruses or fraud. Among current non-users of the Internet, a smaller proportion of women than men express attitudes hostile to the technology *per se*.

There were gender differences in respondents' accounts of how they learned to use the Internet, with around 60% of women reporting that they had received help and 52% of men claiming to be entirely self taught. A family member or a friend were the most common sources of help for both sexes, with family members being significantly more important for women. A majority of users of both sexes said that they had received help from someone over the last year, suggesting that learning does not occur only at the time of initial use.

Although women rated their current ability less highly than men (with 18% of men but only 10% of women saying they were 'excellent'), few users of either sex thought they were 'poor' or 'very bad', and the same proportion (46%) rated their ability as 'good'. On average, women have been using the Internet for a shorter time than men (13% of female and 9% of male users said they first used the Internet less than a year ago). Length of use does correlate with self-rated ability but, even controlling for length of experience, women rate their own Internet abilities lower than do men. There is extensive psychological research evidence (e.g. Fletcher 1999) showing that women tend to underrate their abilities (in comparison to men's self-rating and to third-party assessment), so there are reasons for being cautious about assuming that women are genuinely less competent users than men. Nevertheless, self perception of limited competence may well affect confidence and forms of use.

### *Take-up of access*

Internet use in Britain is still significantly divided by gender, with 64% of men and 55% of women questioned in the OxIS survey saying they currently used the Internet (6% of both sexes defined themselves as past users). Given the predominance of women in the overall population, this translates into 47% of Internet users being women.

The most significant demographic difference in Internet use for the OxIS sample was by age, with school children over 14 almost universal users (with no gender difference) whereas only 25% of men and 18% of women who had retired were users. The survey also shows an association between being an Internet user and the number of people in one's household over 14. Nevertheless, even controlling for these variables leaves a significant relationship between gender and Internet use.

As already mentioned, women tended to have started to use the Internet more recently than men and were somewhat less confident about their ability. These factors also correlate with the average time spent on online activities in a typical week. However, when length of experience is matched, women are still spending less time online than men. The data available do not allow one to explore whether this is the result of time competition from other activities, less interest in using the Internet or less flexible or extensive access (women are less likely to have home access and the survey did not explore the terms on which household members shared access where it does exist).

Other measures that might be seen as indicators of a relatively more sophisticated use of the Internet also correlated with gender, such as creating Websites and the frequency of use of bookmarked sites and search engines. Given that the relationship between experience, use and confidence is gendered, this supports the view that one needs to explore in more detail the quantity and 'quality' of such use, rather than simply use *per se*. It also suggests the need to be cautious about simply defining women as 'lagging users' whose patterns of use will 'catch up' with men's at some point.

An additional problematic finding for the argument that the gender divide will be eroded by diffusion relates to the demographic characteristics of male and female non-users. While male and female users are broadly similar in terms of age, social class and educational profile, non-users are not. Although the differences are not large, female non-users are significantly more likely than male non-users to come from a low social class (classified by chief income earner) and have limited educational attainment. This could be important for both their motivation and ability to become Internet users.

In terms of current use, women were less likely to spend at least an hour a week on almost all Internet activities. The only exceptions were in studying, on which a slightly higher proportion of women than men spent an hour or more, and e-mailing, instant messaging and banking where the proportions were very similar. The most significant gender differences were in the proportion of male users spending at least an hour a week on: listening to music; 'being entertained'; and getting news online. Since the list of activities was determined by the questionnaire, it is possible that some areas of Internet content that other surveys (e.g. Madden and Rainie 2003) have shown to be of particular interest to women, such as health information, were missed.

### *Impact of access*

Some differences in Internet use between men and women have already been discussed, but how significant have such changes been for their lives? Women responded somewhat more negatively than men to the statements 'the Internet will make my life better' and 'technology is making things better for people like me'. When asked about their original motivation for going online, however, there was little difference between men and women in response to the option 'to learn about the Internet and Web', with nearly two-thirds of the sample saying this was an important or very important reason. These findings are potentially interesting in relation to the validity of widely perceived gender stereotypes about women not being interested in machines or technologies other than in an instrumental way, whereas men are thought to view science and technology as a source of fun, enjoyment and pleasure (Sorensen 2002). Yet, it is difficult to know how people understood such statements and the reasons for their responses on the basis of quantitative data.

Many of the gender differences in Internet use revealed by OxIS suggest that the technology is being used by men and women as a different, or additional, way to continue with their existing activities rather than as a stimulus for more fundamental changes in what they do. But two areas of stereotypically female activity do show some interesting results—shopping and communicating with friends and family.

There was virtually no difference in the proportion of men and women who said that shopping, buying and looking for products and services online, was an initial motivation for using the Internet. In terms of those people who said that they currently spent at least an hour a week on this activity, men were slightly in the majority. One would need to know more about the types of products and services being purchased and their relationship to offline purchasing behaviour to assess whether this signalled an emerging change in gender roles.

Similarly, there was little gender difference in those who said that communicating with friends by e-mail was an important or very important motivation for initial Internet use (although women were more likely to say it was very important); the data show similar proportions spending at least an hour a week on e-mail. Nevertheless, the survey also asked whether respondents communicated with friends and family via meetings, telephone calls or writing and confirmed that women were more likely to do so than men. This finding suggests that while women are using the Internet as an additional communication medium, it may be leading some men to maintain active relationships that they would not have done by other means. Men also reported checking their e-mails more frequently than women.

## **Conclusions and policy implications**

The above examination of key dimensions of access helps to unravel some of the debates around gender inclusion in Internet use. The commonly-held prejudice that women are less interested in technology than men could lead to their slower adoption rates being seen as 'natural' and not worthy of investigation or policy concern. The closing gap in numbers of men and women using the Internet in many countries might be seen as confirming such views. However, such assumptions are in danger of missing the emergence of more subtle differences in practice, and of failing to explore the reasons for the choices people make about whether to adopt and use this technology and the significance of such decisions. The Internet is an evolving technology whose content and form is changing, at least in part, in response to current users. Late adopters may be faced with a technology that has been shaped by the interests and preferred methods of interaction of early adopters. This may contribute to continuing social exclusion by making it less interesting or appealing to current non-users.

The data therefore do show that a gender divide continues to exist, not simply at the level of whether or not a person is an Internet user but also in terms of the amount and type of use men and women make of the technology and their confidence in such use. To understand why this is the case and to predict its longer-term significance would need more in-depth research. However, given that most non-users (male and female) say that lack of knowledge about using a computer and lack of availability of a

computer are their main reasons for not using the Internet, one should be wary about assuming that this is always an informed choice.

Providing supportive surroundings for access and associated non-intimidating training are likely to be appropriate ways of extending women's Internet use on the basis of these data, since women at least believe themselves to have limited competence in using the Internet and seem willing to ask for and accept help. An evaluation by Hall Aitken Associates (2002) of some government-sponsored 'UK Online' centres that aim to provide supported Internet access for the socially excluded reinforces this view, with its finding that female users of the facilities outnumbered men by two to one. For those trying to engage non-users of the Internet, the current good practice guidelines are to start from what people are interested in (see Liff and Steward 2001). This approach also seems to be supported by the findings presented in this Brief. However, the data on shopping and e-mail suggest that there should perhaps be a warning not to assume that such interests are gendered.

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### **Further reading**

More theoretical accounts of the relationship between gender and technology can be found in the following publications:

- Faulkner, W. (2001) The Technology Question in Feminism: A View from Feminist Technology Studies. *Women's Studies International Forum* 24:79–95.
- Wajcman, J. (2000) Reflections on Gender and Technology Studies: In What State is the Art? *Social Studies of Science* 30:447–464.

Accounts of a wide range of European initiatives to encourage women to participate more fully in the information society can be found at [www.rcss.ed.ac.uk/sigis](http://www.rcss.ed.ac.uk/sigis) and [www.steunpuntgelijkekansen.be/main.asp?c=\\*GENDERICT](http://www.steunpuntgelijkekansen.be/main.asp?c=*GENDERICT)

## Notes

<sup>1</sup> Details of the survey can be found at <http://users.ox.ac.uk/~oxis/index.html>

<sup>2</sup> Since around 40% of UK employers in 2002 (UK Online, 2002) placed restrictions on which employees were able to access external e-mail or browse the Web, the extent to which such work access can be realized in practice is difficult to interpret.

## About the authors



Sonia Liff has carried out research since the 1980s on the ways in which technical change affect gender issues in the workplace. In the 1990s, working at Warwick Business School, she researched and published extensively on the development and implementation of workplace equality policies and gendered practices and cultures within organizations. Most recently, her research and publications have focused on social inclusion in the information society. These include research projects on cybercafés and community technology centres as new sites for Internet access and on competing models of community/place-based Websites. She has been an Academic Visitor at the Oxford Internet Institute, 2003–04.



Adrian Shepherd is Survey Research Officer at the Oxford Internet Institute. His research agenda covers a wide variety of Internet topics, particularly the current state of the digital divide in Britain and the world, social responses to the Internet and the validity of general population surveys using the Internet. Recent research includes analysis on the formation of cyber trust through first-hand online experience, comparing the effect of Internet use on sociability in Britain and America, and likely effects of increasing intra-party democracy in Britain.

## Gendered by design

Comment 1 on *An Evolving Gender Digital Divide?*  
(Sonia Liff and Adrian Shepherd, OII Internet Issue Brief No. 2, July 2004)

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### **A valuable contribution to the 'gendered Internet' debate**

The Internet has had a reputation in feminist theory for being biased towards the interests and styles of men. That the Internet is somehow 'gendered' encompasses many possibilities. These range from the idea that the Internet may appeal differently to men and women because male values have been institutionalized in technology through its creators—embedding a cultural association with masculine identity in the technology itself—to the claim that content online, such as the proliferation of male-oriented pornography, is inimical to women.

OII Issue Brief No. 2 by Liff and Shepherd (2004) is thus a welcome intervention, both in clarifying the terms of the debate and in injecting valuable empirical data. Much has been made of the disappearance of the gender divide in Internet access, which these findings confirm. But the authors stress the need to attend to more subtle differences in practice, such as the quality of access, rather than only considering technical access. While there may now be less cause for concern about sex inequalities in Internet access, gender differences in the amount and type of usage remain.

### **Learning from the findings**

What are we to make of these findings? To begin with, the data showing that the gender gap is closing provide a useful corrective to enduring stereotypes of women as less interested in, and competent with, technological pursuits. Indeed, as I describe in my book *TechnoFeminism* (Wajcman 2004), cyberfeminist writing is optimistic about the possibilities that the Web, both as a tool for political organizing and as the means for exploring alternatives, offers hybrid gender identities to women. Whereas industrial technology may have had a patriarchal character, digital technologies, based on brain rather than brawn, on networks rather than hierarchy, herald a new relationship between women and machines.

However, Liff and Shepherd point out that, as late adopters, women may be at some disadvantage compared to men. Here, the significance of gender differences resurfaces. A recurring theme in the social studies of technology is the intrinsic connection between design and use. Examining the ways in which artefacts may be shaped by gender power relations can improve our understanding of how techniques invite or inhibit women's involvement.

While the gender divide in usage may be closing, that within technical design appears to be growing. According to the US National Science Foundation (2004), for example,

women's participation in the information technology, electronics and communications sector has declined from 37% in 1993 to 28% at the start of the twenty-first century. This gender inequality in the professions and industries designing and producing Internet technologies is surely related to the Brief's finding that women are less intensive users of the Internet and less confident of their skills. While it is heartening to see that young women in particular are colonizing cyberspace, they also need to colonize the engine rooms of technological innovation in order to reshape the world we live in.

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## A comparative perspective from US surveys

Comment 2 on *An Evolving Gender Digital Divide?*

(Sonia Liff and Adrian Shepherd, OII Internet Issue Brief No. 2, July 2004)

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The analysis of the 2003 Oxford Internet Survey (OxIS) in OII Issue Brief No. 2 (Liff and Shepherd 2004) makes several interesting and useful arguments, but two primary ones. First, while general surveys seem to indicate the closing of a gender digital divide in Internet usage, a more contextualized look reveals remaining and possibly persistent gender divides. Second, the concept of the digital divide can productively be considerably widened to include various components of access. I would like to comment on these key issues.

### Gender differences in Internet use

On the first point, generally, gender differences in 'simple' Internet usage in the US have disappeared. Studies (e.g. Jupiter Communications 2000; Katz et al. 2001; *USA Today* 2001; *Yahoo!News* 2001; Shade 2004) note that at least racial and gender differences in Internet use disappear after other variables are taken into account statistically. Men do use the Internet a bit more, about 10.5 hours per week compared to 9 hours per week, and view about 31% more pages than do women. And men are more likely to have been online for more years, reflecting the initial gender divide, with implications for increased expertise, contacts, and other advantages/disadvantages.

In analyses undertaken with four nationally representative surveys (1995, 1996, 1997 and 2000) of Internet users and nonusers, Jim Katz and I found that 50.6% of US Internet users in 2000 were female (Katz and Rice 2002). Comparing respondents by the year they said they began using the Internet (that is, not as of the year of the survey), newer Internet users were proportionally more female. Once awareness of the Internet was achieved, and other factors were statistically controlled, there was no digital divide in 2000 based on gender or race. In regressions predicting various communication activities for Internet users and nonusers, and online interactions for users only, gender had a (small) significant influence only on more letters written weekly. In each of our four survey years, the approximately 10% of Internet users who had stopped using it—'dropouts'—were significantly younger, less affluent, and less well educated than users—but not more likely to be female or African-American.

Mossberger et al. (2003) honed in on demographic aspects of the digital divide in their study of 1190 respondents from high-poverty census tracts, to be able to analyze in greater depth the influences of race, education, and income on what they consider are the four dimensions of the digital divide: access, skills, economic opportunity, and democratic involvement. In addition to income, age and education effects, they found considerably less access, lower technical competency, and lower information

literacy by African-Americans and by Latinos, but no gender differences. However, their overall 'digital access scale' (online activities such as locating political and other information, looking-up government services information, searching or applying for a job, taking an educational class, doing homework, or finding books in a library) was predicted by home access to Internet and e-mail, greater education, lower age, and being male. Shade (2004) also finds that gender differences still exist within ethnic differences (greater use by Afro-American women than men, less for Asian-Americans, and disproportionately more Asian-American women veteran users than other veteran women users). Women are more likely to use e-mail to keep in touch with distant family and friends, use the Internet for health or medical information, communication associations, job information, playing games online, and religious or spiritual information. Women are less likely than men to use the Internet for financial, news, stocks, products or services, online auctions, hobbies or interests, and political or sports information.

### **Another analysis of OxIS data**

My own analysis (with Adrian Shepherd of the OII) of the OxIS 2003 survey data of British Internet users shows that those currently using the Internet (ignoring 'dropouts') were more likely to be male, younger, have a higher socio-economic status, and be more educated. More recent adopters in this and the US surveys mentioned above were more likely to be female. Significant unique predictors of Internet usage in 2003 were: being male, younger, high socio-economic status, and having a higher education. These are the same influences as in the US 1995 data, and, except for gender, the US 2000 data.

The OxIS data allow tests for associations between usage/nonusage and four social interaction activities—meet, telephone, e-mail, and write friends/family, either those who are close (but not within walking distance) or those who live in another country or city. Internet users are significantly *less* likely than nonusers to write letters to friends and family who live far away, but significantly *more* likely to meet friends/family who live far away. Significant regression demographic influences were: being female (meet, phone and write nearby, and phone and write far away); age (younger for meet and phone nearby but older for write nearby and telephone far away); class (higher for meet far away); education (more for e-mail far away); and employment (not full-time for write nearby and faraway). In a regression including two sociability measures and innovativeness, along with demographic factors, only innovativeness remains a significant influence after controlling for the significant influences of higher education, higher class, younger age, and full-time employment (gender was not a significant influence). In all these studies, the overall variance is usually fairly low, and any influence of gender represents extremely small variance.

### **Expanding the concept of the 'digital divide'**

On Liff and Shepherd's second point, I will make one general comment. Every social concept can be expanded, integrated, and broadened or narrowed. So, for example, our own cross-disciplinary analysis of access (Rice et al. 2001) identified, and validated, six main dimensions of access to information, four main facets of information-seeking, and six main influences/constraints. Thus, the question arises here: just what do we

mean by 'digital divide'? If we expand this to include different aspects of access—reasonably so—then we must pursue this new expansion comprehensively. But this expansion reveals the greater generality of issues of access, so we must also ask whether this is not in fact a separate concept—that is, not necessarily a form of digital divides, and not necessarily indicative of gender *per se*.

## Conclusion

As a general conclusion, then, I might argue that some gender effects in Internet research are a result of the conceptualization of the 'digital divide' (such as dimensions of access), the kinds of analysis and measures of usage, the study methodology, and the national sample. It is therefore problematic to draw strong policy conclusions from any single study of Internet use. The significance of the gender divide varies across nations and over time. While, on balance, I would argue that the gender divide is diminishing relative to other divides, such as those based on income and education, it is arguably an unresolved issue in most nations of the world, meriting further research and debate as additional evidence accumulates.

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## Digital inequality

Comment 3 on *An Evolving Gender Digital Divide?*  
(Sonia Liff and Adrian Shepherd, OII Internet Issue Brief No. 2, July 2004)

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In OII Issue Brief No. 2, Liff and Shepherd (2004) argue that the basic 'have' versus 'have not' distinction suggested by the term 'digital divide' does not capture adequately the possible inequalities that can result from a more differentiated Internet use across varying segments of the population. Of particular interest here is the different ways in which men and women use the medium, including their levels of technical access, the extent to which they know how to navigate the network, what they do while online and how the Web influences their everyday lives.

There is a small literature developing around such refined notions of the 'digital divide', and rightly so. Some co-authors and I (DiMaggio et al. 2004) have suggested the term 'digital inequality' to move past the binary classification implied by the popularized term 'digital divide', which tends to simplify the potential issues at hand. We list five factors that we consider important: technical means (quality of equipment); autonomy of use (the ability to use the medium freely when and where one wants to); skill (the ability to use the Web for purposes one prefers), social support (the availability of others for assistance), and purposes of use (the activities performed by users). Some researchers have focused on nuanced measures of political divides with respect to Internet use (Norris 2001) or explored international divides in detail (e.g. Warschauer 2003).

Although several other papers exist that attempt to move the research agenda forward in this direction, these pieces—including Liff and Shepherd's 'An Evolving Gender Divide'—stand out because they draw on empirical evidence to illustrate their point. By drawing on data, they make a convincing argument for why more fine-grained explorations of digital divides are essential for a full understanding of how some segments of the population may be falling behind with respect to Internet use, even if they do have basic technical access to the network.

Findings from surveys often raise additional questions. It will be interesting, for example, to see the extent to which the influence of gender may be mediated by factors not included in the present analyses. For example, women often have lower income and may be in the labor force less, which may limit their access to network-connected computers at work. Moreover, as Liff and Shepherd note, many women came online later than men, and it may be their later adoption that influences some other variables rather than gender *per se*.

In addition, the suggestion that gender roles with respect to shopping might be reversing may require a more in-depth look. Considering that men have been online longer and spend more time online than women, they may know about and be able

to take advantage of more services on the Web than their female counterparts. This may have less to do with interests in shopping, and more to do with online abilities in general or easier access to online resources at convenient times and locations.

It is helpful and interesting to see differences by gender regarding nuanced measures of Internet use. More detailed analyses will help shed light on the extent to which the relationship of gender to online behavior may be mediated by other social factors.

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