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Toward global measurement of the information society: A U.S.-China comparison of national government surveys

by Kate Williams
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Abstract

To be global, digital and inclusive, we need comparable measures of ICT use around the world. To contribute to this, this research note analyzes what questions the Chinese and the U.S. governments ask in their large, long-running surveys on the topic of computer and Internet use. The process and content of these surveys point up agreements, differences, and silences. Based on this, we propose nine basic questions that can be standardized and used in all country surveys of ICT use to create a coherent global dataset.

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Introduction

Our current experience of globalization is founded on the broad and transnational use of digital technologies. But scholarship regarding this use is often limited to the national scale at best. As a result, we risk drawing parochial conclusions that trail behind actual social life. This paper demonstrates how to use today's "invisible college" (de Solla Price, 1963; 1986; Lievrouw, 1990) together with the power of the Internet to surmount this problem. It aims for a global science which can then inform global — and in turn national — policy, especially with regard to standardization. Bollen, *et al.* (1993) present a useful summation of the measurement issues involved in standardizing global data. James (2009) proposes a simple solution to the problem by using just two indicators that are widely available for a number of countries: number of Internet users and number of cellphone subscribers. What greater detail can we get?

In order to govern, allocate resources, and plan, all governments who can do so investigate their population's use of computers and the Internet. The U.S. and China are two interesting cases: each a global power, one the purported birthplace of all things digital and the other the world's largest production house and consumer market. (Important contextual discussion of how the Chinese society in the age of the Internet can be found in Qiu, 2009 and Yang, 2003.) This paper presents findings from an initial comparison of two national survey efforts, the U.S. Current Population Survey computer and Internet use supplements (10 surveys over 1984–2007) and the China Internet Network Information Center's Internet development reports (22 surveys over 1997–2008).

Examining and comparing the two surveys' process and content points up agreements, differences, and gaps. The questions asked in China and the U.S. suggest nine questions that could augment existing efforts towards global standardization in measuring country-level access to and use of information and

communications technologies (ICT). We also invite other researchers to contact us and use our English-language collection of the questions asked in the two surveys.



Methodology

The term “invisible college” refers to the communiqués and the travels that have connected the world’s intellectuals for at least several hundred years. It is invisible compared to the visible research institutions dotted around the planet and the journals and books published online and off-line. As an example, this study was enabled by an e-mail inquiry from one author to the other. This led to a visiting position at the University of Illinois with funding from the China Scholarship Council. Comparisons and exchanges between China and the U.S. were one of our research interests. For this study we collected the surveys, translated from Chinese into English as needed, and reformatted the digital content into a large spreadsheet for analysis.

The U.S. surveys are available online [1]. China’s Internet Development Reports are also comprehensive and freely available online [2], although the questionnaires themselves are not. We used the reports to backwards-engineer the questions and translate them into English. We excluded all questions concerning demographics and other non-ICT topics. We thus built a database, essentially two tables in a spreadsheet, from the inferred Chinese questions and the U.S. questionnaires.



Frequency, length, and size of the surveys

	US	China
Oct 1984	7	
Oct 1989	9	
Oct 1993	11	
Nov 1994	10	
Oct 1997	16	
Oct 1997		5
Jul 1998		13
Dec 1998	26	
Jan 1999		15
Jul 1999		24
Jan 2000		34
Jul 2000		38
Aug 2000	26	
Jan 2001		42
Jul 2001		42
Sep 2001	31	
Jan 2002		43
Jul 2002		37
Jan 2003		42
Jul 2003		51
Oct 2003	29	
Jan 2004		47
Jul 2004		51
Jan 2005		52
Jul 2005		39
Jan 2006		16
Jul 2006		24
Jan 2007		22
Jul 2007		11
Oct 2007	3	
Jan 2008		10
Aug 2008		10

Table 1: National surveys by month administered, showing number of questions.

As Table 1 indicates, the U.S. survey began in 1984; the Chinese survey in 1997. They vary in length, with on average 17 ICT use questions (U.S.) and 30 (China). Over time, both the U.S. and the Chinese surveys get longer and more detailed, as indicated by the number of questions, and then shorter. For the U.S., the length increases sharply in 1997 and 1998, and shrinks precipitously in 2007. U.S. markers over this period include the 1994 Clinton–Gore information superhighway/digital divide policy push, the 2000–2001 dot-com bust, and the 2001 start of the Bush presidency.

In China, the survey appears to lengthen from 1997 to 2004, and then becomes shorter over the years 2005–2008. We say appears because as “backward-engineers” of the surveys themselves, we are estimating the survey length from the questions for which data is publicly reported. As we finished this paper, CNNIC fielded their July 2009 survey, which included 99 questions about ICT. It is likely that both the U.S. and China package and sell their data to commercial interests.

An additional comparison can be made in the frequency of the surveys. The U.S. survey has been

conducted 10 times over 23 years. The Chinese survey is done every six months. The U.S. survey has been carried out alongside the much smaller but far more frequent Pew Internet and American Life surveys, which were first fielded in March 2000 and have continued several times a year [3].



Size and representativeness of the surveys

	Households	Household members		Individuals in the armed forces	Total individuals
		Adults	Children		
Oct 1984	59,000	169,786	51,482	0	221,268
Oct 1989	53,600	180,123	52,667	0	232,790
Oct 1993	57,000	110,365	32,764	517	143,646
Nov 1994	54,000	107,506	32,110	568	140,184
Oct 1997	48,000	95,105	27,755	389	123,249
Dec 1998	48,000	95,061	27,490	384	122,935
Aug 2000	48,000	94,984	26,449	312	121,745
Sep 2001	57,000	111,778	31,098	424	143,300
Oct 2003	57,000	109,650	29,932	276	139,858
Oct 2007	55,000	106,349	27,169	444	133,962

Table 2: U.S. survey response, from *Current Population Survey*.

As Table 2 shows, the U.S. survey is carried out by telephone interviews with more than 48,000 households. Generally everyone in the household is interviewed, sometimes by proxy. To have adequate data about households without landline telephones, households with a demographic profile that matches households without telephones are oversampled. (According to the 2007 American Community Survey, 94.6 percent of U.S. households have landline telephones; in the 2000 Census that figure was 97.6 percent.) Thus the U.S. surveys are designed to be representative of the entire U.S. population. The U.S. survey began with a large N of 221,000 individuals, then dropped to an average of 135,000 +/-12,000 individuals during the period 1993 to 2007.

	Online survey respondents	Telephone survey respondents		Total sample
		A + C1	B + C2	
Oct 1997	Questionnaires online and in <i>Computer World</i> newspaper			1,802
Jul 1998	2,494		0	2,494
Jan 1999	>22,000		0	>22,000
Jul 1999	52,549		0	52,549
Jan 2000	202,432		0	202,432
Jul 2000	573,902		3,679	577,581
Jan 2001	26,667	62,620 and 6,000 face to face interviews		95,287
Jul 2001	78,342		52,700	131,042
Jan 2002	64,627		52,700	117,327
Jul 2002	14,592		4,800	19,392
Jan 2003	29,948		49,600	79,548
Jul 2003	19,096		4,800	23,896
Jan 2004	16,760		49,600	66,360
Jul 2004	17,883		7,200	25,083
Jan 2005	23,506		49,600	73,106
Jul 2005	18,136	5,000	4,000	27,136
Jan 2006	24,068		32,106	56,174
Jul 2006	16,332	7,200	4,000	27,532
Jan 2007	20,183		32,325	52,508
Jul 2007	21,714	7,500	5,000	34,214
Jan 2008	69,559	31,802	4,000 + 10,498	115,859
Aug 2008	0	7,000	2,000 + 7,000	16,000

Table 3: China survey response, from CNNIC.

A+C1 indicates residents with household telephones including a "handy phone," a reduced price cell phone; B indicates college students boarding at school; and, C2 indicates residents without home phone but with cellphones.

As Table 3 shows, the Chinese survey began with 1,800 respondents and has fluctuated from a high of 578,000 at the peak of the dot-com boom to a recent low of 16,000. It has used online, print, telephone, and face-to-face surveys. As of December 2008, 340,804 million people, nearly 30 percent of individuals in China, had household phones including the "handy phone," a reduced price cell phone, and 641.23 million, over 50 percent of individuals, have cell phones [4]. The CNNIC assumes that individuals without any phone are not online. With this assumption and with the large online response, it is possible that the survey is missing more than 12 percent of Chinese people and is not representative of the whole population.



Content of the surveys

	US	China
Oct 1984	7 (100%)	
Oct 1989	2 (22%)	
Oct 1993	2 (18%)	
Nov 1994	6 (60%)	
Oct 1997	5 (31%)	
Oct 1997		5 (100%)
Jul 1998		8 (62%)
Dec 1998	19 (73%)	
Jan 1999		7 (47%)
Jul 1999		13 (54%)
Jan 2000		19 (56%)
Jul 2000		14 (37%)
Aug 2000	1 (4%)	
Jan 2001		6 (14%)
Jul 2001		2 (5%)
Sep 2001	15 (48%)	
Jan 2002		8 (19%)
Jul 2002		7 (19%)
Jan 2003		6 (14%)
Jul 2003		17 (33%)
Oct 2003	4 (14%)	
Jan 2004		5 (11%)
Jul 2004		7 (14%)
Jan 2005		9 (17%)
Jul 2005		20 (51%)
Jan 2006		4 (25%)
Jul 2006		12 (50%)
Jan 2007		10 (45%)
Jul 2007		3 (27%)
Oct 2007	0 (0%)	
Jan 2008		2 (20%)
Aug 2008		0 (0%)

Table 4: New questions in each survey.

As Table 4 indicates, each time a survey is offered, some questions are reused, others are revised or dropped, and new questions are inserted. Both countries innovate and adjust to new technologies. The surveys of December 1998 in the U.S. and July 1999 in China almost at the same moment reflect both innovation (many new questions) and breadth (many questions altogether).

	US	China	US as %	China as %
Uses	46	310	27%	46%
Connecting	35	37	20%	6%
Places	34	25	20%	4%
Ownership	29	0	17%	0%
Attitude	12	209	7%	31%
Devices	9	15	5%	2%
Frequency	7	50	4%	7%
Identity	0	17	0%	3%
Discourse	0	5	0%	1%
All questions	172	668	100%	100%

Table 5: The Chinese and the U.S. survey questions reflect nine aspects of computer and Internet use.

As Table 5 shows, nine categories emerged from a coding of all the survey questions. The U.S. survey emphasizes ICT uses, details of connecting to the Internet, places people use ICT, and ownership of digital tools. The Chinese survey emphasizes ICT uses and people's attitudes towards all aspects of ICTs. Perhaps reflecting a socialist ideology, there are no questions about ownership. On the other hand, while China quite steadily maintains a question about "netizens" — with small shifts in the definition of this term — the U.S. survey does not conceptualize or name people who use the Internet. Following from this, the U.S. does not ask people what they know about computers and the Internet, while China asks people if they know certain technological terms from the current discourse.



Global standardization: Towards a model questionnaire

	US	China	ITU	OECD
Uses	✓	✓	✓	✓
Connecting	✓	✓	✓	✓
Places	✓	✓	✓	✓
Ownership	✓		✓	
Attitude	✓	✓		
Devices	✓	✓	✓	✓
Frequency	✓	✓		✓
Identity		✓	✓	
Discourse		✓		

Table 6: Compared to two other existing frameworks for global standardization of data collection, the U.S. and Chinese surveys cover more of the nine aspects.

Note: ITU = International Telecommunications Union; OECD = Organization for Economic Cooperation and Development.

As Table 6 indicates, the International Telecommunication Union (ITU) survey poses questions on ICT uses, connecting, places, ownership, devices, and identity (ITU, 2007), while the Organization for Economic Cooperation and Development (OECD) survey poses questions on ICT uses, connecting, places, devices, and frequency (OECD, 2009a, 2009b; OECD Working Party on Indicators for the Information

Society, 2009). Neither of them asks about attitude or discourse. But both organizations are engaged in an ongoing search for standardized data [5].

	Model question
Uses	How do you use computers/the internet?
Connecting	What mechanism do you use to connect to the internet?
Places	Where do you use computers/the internet?
Ownership	What computer/internet devices do you own?
Attitude	What is your attitude towards computers/the internet?
Devices	What computer/internet devices do you use?
Frequency	How often do you use computers/the internet?
Identity	Are you a netizen?
Discourse	What computer/internet related concepts do you know?

Table 7: Nine questions comprise a model survey that could be asked worldwide.

The questions in Table 7 could be asked worldwide with control variation appropriate to the country, but yielding comparative data. The identity question expresses both practice and self-conceptualization. The discourse question addresses not skills but knowledge, part of mastery of the new tools and the new society. The questions taken together incorporate the U.S. focus that is rooted in the digital divide origins of the U.S. survey: who is connected, where, what are they doing. And they incorporate the Chinese focus on their population's experience and attitude towards the digital age, conceptualized neatly and powerfully as the netizen [6].

Our technologies are clearly global, but why do we need globally comparable data? Because without it, international and national policy lags behind. Governmental and other agencies need data to implement useful programs and services. Commercial interests need data to understand their markets. And civil society needs data to inform its debates and actions on issues which are quite typically both local and global. On all these fronts, ICT and the continuing invisible college enable global, data-driven practice. 

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Notes

1. As of June 2009, The U.S. Computer and Internet Use supplements to the *Current Population Survey* from 1990 to present are available at <http://www.census.gov/apsd/techdoc/cps/cps-main.html>. Earlier surveys are documented at <http://www.census.gov/population/www/socdemo/computer.html>.
2. Information about the surveys done by the China Internet Network Information Center since October 1997 is available at <http://www.cnnic.net/index/OE/00/11/index.htm>.
3. For more information, see the Pew Internet and American Life Project history, available at <http://www.pewinternet.org/Static-Pages/About-Us/Project-History.aspx>.
4. Ministry of Industry and Information Technology of People's Republic of China, available at <http://www.miit.gov.cn/n11293472/n11295057/n11298508/11912660.html>.
5. For example, a number of papers are posted at <http://www.itu.int/ITU-D/ict/papers/index.html>.
6. For comparable terms used in the U.S. literature, see Howard, *et al.*, 2000 on netizens and Mossberger, *et al.*, 2007 on digital citizenship, both cited in Buente, 2009.

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