Methodological Changes and Challenges in Disaster Research: Electronic Media and the Globalization of Data-Collection*

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Within the last decade, computers have conquered and transformed our field. At first they only substituted our typewriters, then, step by step, we withdrew from the hard "return" at each line and understood what "floating text" means, we qualified in wordprocessing, desk-top-publishing, spreadsheeting and the tricks of converting differently formatted text- and data-files. We spent hours and hours with all that realizing at the end that we became quite good in taking over all the professions which were necessary to transform a formerly handwritten manuscript into a ready-to-print-copy. However, these aspects of social change almost came about behind our backs. In the forefront other changes were foreshadowed: Our modes of writing began to change. We discovered the advantages of "modular-writing" and "multi-using" of text-blocs, of cut and paste, move and insert and, top of all, of databases: adresses, literature, notes, quotations, excerpts, news, clippings. Our productivity increased as well as the number of publications. Whether quality increased is hardly to say. We all know publications which differ only in their headlines and we also know this diffuse déja-vu: didn´t I see (read) that before once or twice or even often?

The next improvement entered our studies with scanner technology, imaging and optical recognition. News paper articles no longer needed to be retyped, originals and pictures no longer to be stored in space-consuming archives. On the other hand gigantic harddisks became necessary and fast backup-media as well as powerful software to organize and manipulate the image-files. Again, our modes of data-handling changed: We learned to present our data better, we created computerized slide-shows and we slowly entered multi-media. With that, teaching changed also, because we learned to utilze all these nice little built-ins in SPSS and other software to project graphs, tables and multi-layer-maps directly from our computer to the classroom screen.

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Most of us had scarcely climbed up to higher productivity when the Internet opened its gates and linked us with electronically multiplied strings of millions of users. Rob Kling (1997) gave a nice example of how the Internet and its services influence our scientific handycraft: e-mailing, electronic discussion groups, web-conferencing, searching indices, publications, abstracts, conferences and its papers and proceedings. Most of us have put their homepages into the net, almost all institutions - universities, labs, companies, churches, agencies, governments - are represented. Within minutes we can click through their branches and offices, make contacts and get information. We can down- and upload files and software, drivers and bug-fixes, updates and viruses - and we leave prints and profiles. The best of all, no doubt, is searching the web for, let us say: information - no matter of what it consists: services, software, images, movies, sounds etc.. Within seconds or after a coffee break at last, our search engines and, more sophisticated, our web agents serve us best while they optimize themselves along our preferences. (And some secretly work for others too.)

Nevertheless, we again spent hours and hours, trying to survive the battle between browsers and their incompatibilities, the horror of encoding and decoding, zipping and unzipping and converting files and data into "legible" formats. We remember our first impressed amazement at gazing at the hitlist our search engine has cataloged, let´s say for: "Panic" - but also our disconcert when we realized that more than 90 percent of these 233460 hits (with Alta Vista) are useless for disaster researchers purposes. Yet, endowing surprises are unevadable: "Rip Rig And Panic" are, as well as the German "Panik Orchester", nice and cranky musicians...

Unevadable as well, then, was the need for further qualification. Now, most of us know a lot about Boolean operators, command syntax differences, protocols, networking, Hypertext Markup Language, cookies and applets. And again we realize changes behind our backs and of ourselves: Was the writing humankind´s first intellectual revolution, then computer-literacy may be seen as the second one. Both do sort strictly along access to and dispose of knowledge - which is, of course, not identical with information. However, information is the basis, the material of knowledge. In this respect the net is revolutionary because of its accessibility and feasibility. No wonder that dictatorships try to cut the net access of their literate people, no wonder either that the net becomes a melting-pot of all participants, whose traditional, mostly nationally and/or ethnically based "stock" of literacy - language, literature, poetry, narratives etc., - will be transformed into

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some sort of "net-speech-computeranto" nobody has heard before.

Successively, a global commune of data-accessors and -distributors emerge whose links decide about "significance". More than ever, quality becomes key because quantity is overwhelming and, worse, indecisive and indeterminate. The Disaster Research Unit I work with together with significant disaster relief organizations momentarily establish a net-based interactive database (www.soziologie.uni-kiel.de/~wdombro/waktuel.htm) of individuals and organizations who offer psychological assistance for traumatized disaster victims and relief personnel. The main aim is to make the offers public and comparable, to define criteria and standards of appropriate and reliable assistance and to inform those who seek for assistance about qualifications, experiences and references. Many web offers advertise what nobody can assess or evaluate: Is it serious, reliable, helpful, inventive? And who is behind the site? Somebody highly motivated yet unexperienced, an unemployed psychologist or social worker who seeks an opportunity, or simply free-riders who want to exploit the acute topic of PTSD and crisis intervention? The example and the problem behind is ubiquitous.

Rob Kling (1997:438) asked similar questions and arose analogue problems:

> The Internet generally priviliges speed of connecting authors and readers, serendipity, and novelty over epistemological reliability (as mediated by peer review, publishing houses, and curated libraries). Some of the arguments that the Internet enhances democracy rest upon the ability of a wider array of people to post materials for broad readership. But the materials may range from works of genius to foolish ramblings; and it is also possible to easily create spoof sites - such as posting "translations of the secret correspondance between Durkheim and Marx"!

But there are not only spoof and indecisive sites but also spam-mails and hostile activities, there is also time-waste (the "World Wide Wait") and overload with garbage and outdated information as well as misleading links and dead URLs. In the last resort new services become necessary, agents and assistants, which help the users to find, sort, evaluate and organize the world-wide vagabonding and often vague information, to update URLs and e-mail-adresses and to check links and sites. (See as examples: www.theangle.com; www.ai.mit.edu/people/sodabot; www.agentware.com; rg.media.mit.edu:80/projects; bf.cstar.ac.com/lifestyle/). Consequently, some type of commercialization is unevadable due to the fact that the Internet is (still) free - free in regard to upload whatever one wants to.

As a matter of fact, the Internet has changed our modes of working, writing, organizing and teaching. The net has accellerated our communication and the interchange of data of all kinds. We can read complete books and articles on-line and we can download documents right into our own texts. Once, the knowledge of humankind will be accessible from every desktop-terminal, alike the virtual visits of museums (as example: www.isst.fhg.de/~lemo), music halls, buildings or exhibitions already are. The net has intensified and globalized our research. Better than ever we can know what our collegues are doing worldwide. The net opened, sometimes bursted "in-groups" and citation-cartels because of cataloging sites of scientists from the "peripheries", in terms of regions, languages, paradigmatic orientations or resources. We can have broader perspectives, wider arguments, more detailed examples and a broader empirical basis of on-going and finished projects, results and applications.

The net also has enabled access to institutions, agencies and governmental and non-governmental organizations. In my own field, I appreciate the convenience of accessing the sites of FEMA, WHO, DHA, UNHCR, PAHO, IDNDR or ECHO (to name only some). I also appreciate the helpful sites of the Natural Hazards Research and Application Center (www.colorado.edu/hazards), of the Disaster Research Center, Newark, Del. (www.udel.edu/DRC/), of NOAA (www.csc.noaa.gov/) or of Emergency Management Australia (www.ema.gov.au), or the Int. Committee of the Red Cross (www.icrc.ch) - to pick a few only (useful overviews give Butler 1997 and Gruntfest/Weber 1998). Most of us have experienced the easyness to search for publications, mission reports, materials and unpublished or inofficial papers. Special services like listings of worldwide conferences, of tables of contents, of abstract indices, of sorted events or categorized tables of specific disasters (like volcanoes, floods, earthquakes etc.) have made research easier and communication more efficient. In many cases, the easyness of accessing has made co-operation and mutual contacts possible, has opened doors to learn about problems and about desirable and possible solutions, about research needs and available fundings.

The most exciting aspect of the web, however, is the integration of text, sound, images, video, radio, TV and satellite. No problem to download the latest CNN-video-sequences of disasters, wars or riots, of radio-broadcasts or interviews, of Videotext-Information or Intercast-data. Many providers offer "news-reader"-services which provide us daily with specific information, specialized programs like "Paperball" (www.paperball.de) serve

with key-word-centered news of German news papers, most magazines, like "Stern" (www.stern.de) or "Focus" (www.focus.de), have opened their archives for research: cut and paste worldwide, no matter of what, no matter for what...

In the meantime, I dispose of 18 Gigabyte of exciting pictures, graphics and videos of vulcanoe eruptions, earthquakes, storms, floods and air crashes. My students love the collapses of bridges and buildings most, but also the jumps to death during a high rise building fire. Teaching is turning into a multi-media-Internet-session and paper-work into funny eclectic site-citing, like pearls on a string, combined to a huge HTML-document, which runs off-line on my computer but has to be turned on-line when all the cited sites and links should be visited - and checked.

All that is nice and welcomed, some aspects, however, are often overseen or neglected. After surfing the net for hundreds of hours and, more time consuming, after years of more or less continous self-teaching, going hand in hand with upgradings of the soft- and hardware (which indirectly did again cost months and months to earn the money for), I doubt in clear accelleration and a sum-total increase in productivity. I won´t miss neither the computer nor the net, although, both do operate far below its potentiality. I still miss an adress-software or -module that really works together with all others (with browsers, office-suites, databases), I still miss standards in protocols, in text- and data- and graphic/picture-files, I still miss automatic converters to make encoded attachements legible, I still miss a secure driver-management, instead of being forced to backup a stable system before testing a new program or a hardware-component. I hate messing around with layouts, fonts and sizes because of using different printers (only few use postscript-printers or LaTex). I hate all these needless throw backs from so-called software "updates" that change key-combinations, makro-languages or other central features for organizing ones work. And I still hate to compensate the lack of quality of software by searching the web for bugfixes, "tricks & tips" and "inside-information".

Yet, the computer isn´t the universal machine it could be, if released from economical, political and entrepreneurial limitations and competetive interests. From a technological point of view, there is no further need for a DOS-, Win3.x/Win95/98-, NT-, OS/2-, Mac-, Unix/Linux-, Alpha- and BeOS-World (look at the emulation of all under Linux!) and its software-incompatabilities the users are not longing for. Neither the net is as universal as it could be. We still suffer from 8-bit-limitations and ASCII,

albeit the 16-bit-based "unicode" is available. Nevertheless, our global communication still relies on the 8-Bit-codings of ISO-8859/Latin-1-Standard which is incompatible with asian fonts (CJK-texts). In contrast to that, the scientists and literate people of the Middle Ages, arrogantly labeled as "Dark Ages", applied a universal language: Latin, their "lingua franca". Today, with the help of the computer and the WWW, such an universal language is more necessary than ever and the most possible to implement since ever. Technologically, we already could have a standardized, universal operating system with a stable, secure kernel, modular driver-packages and safeguarding against hacking (see www.hacked.net) and virus-attacks and globally compatible software. Practically we suffer from the contrary, from computers, software and net-services which pretend to be solutions but force us to pay attention to, although we wouldn´ t without the problems we don´t need either. (The very best example give the myriads of Win95-add-ons and tools which make the ill man run "better" and crash.)

All that has a lot to do with data-collection and electronic media. Globalization, however, remained ephemeral yet, as it were a fashionable label. My student´s homework, this brilliant "site-and-link-quilt" or "net-patchwork", is suitable to meet the point: Picking examples from all over the world has nothing to do with globalization, but with universal unconcern and shallowness, with naive illustration at best. In the first place, the WWW is such a global illustration, a huge reservoir of signs of life, but without sociological meaning. Most of us know their national statistics and its derivates: the average man/woman, demographic distributions, stratification. What or who represents the net and for what is it representative in statistical terms? In Germany 2,49 million homes owe a PC with a modem, 1,85 million homes access the net via the leading providers like T-Online (1,5 million members), AOL (about 300.000) and Compuserve (50.000) (all figures for 1997). A "quantité négligable" compared with the numerical basis of all telefone owners, consisting of approximately 30 million private homes, respectively 42 million registered "main sockets", including business and fax, but without cellular/mobil/satellite telefones. But what does "registered" really mean? The German computer-magazine "PC-Praxis" (10/97:52-58; www.pcpraxis.de) has tested 6 Telefon-Info-CDs and 7 Internet-Telefon-Services showing that up to 50 percent of the entries are incorrect. The German social science research and survey institutes withdrew from sampling out of "telefone-owners" because of the incorrectnes of entries and because of a growing number of owners who refuse to be publicly registered (estimatet 30 percent). Neither the German telefon owner nor the web-surfer is representative, especially the latter is particularly biased - but biased

for what?

This question targets the core of globalization and of global data-collection. The Internet is judged to become one of the fastest growing global markets. The net-users are the pathfinders and trend-scouts of future services, products and habits. The study "Computer-Kids-Tracking" by Roland Berger Institute of Youth Research (IJF, Hamburg) has found that the children of the "biased" segment of computer and modem owning households (N=1204) spent average 70 minutes per day with computing, and 15 minutes from this with surfing the net.

Most children use the computer almost exclusively for playing games, 48 percent use it for school and other "serious" tasks. 77 percent of the male adults use the computer two thirds for business and job purposes and one third for gaming and "goofing around". Female users are still a minority, using the computer preponderately for educational or "serious" purposes. The figures show that in Germany the "knowledge gap" (Donohue/Olien/Tichenor 1987) between "networkers" and "computer&net junkies" hasn´t really opened up yet.

Most German users are looking for "serious applications" which are, in most cases and for both sexes: homebanking, shopping, travel, events, jobs, fitness & health, information. Specialized (German) "online-magazines" with about 2,5 million readers periodically inform about sites and services. Mailing-lists and newsgroups as well as the "novelties" of the mass providers also show trendy developments, they are the early-warning-systems of changing user´s habits and needs.

But who wants to know about these changes? Obviously not sociologists - disaster sociologists the last. More radical than ever the net is spied out by market analysts. Focalink Communications, Palo Alto, for example, is advertising its "Smartbanner"-Technology with which Web-activities can be analysed and transformed into detailed user-profiles, showing preferences, habits and other individual information. Based on these profiles, Focalink sells "psychographical data" with which net-users can be directly adressed and advertised. The company "Doubleclick" works even more effective. The firm evaluates the "fingerprints" of all users who adress to companies which co-operate with Doubleclick. The Web-Server and the user either do not realize that they were detoured via the Doubleclick-server where all the informative cookies are collected.

Doubleclick, established in February 1996 by the New York PR-agency Poppe Tyson ("PT"), is specialized in "Cyber-PR" and co-operates closely with Netscape since 1994. PT strongly recommends the Navigator and offered it for free on its homepage - now Netscape´s Navigator is generally freeware and one hunches why. PT advertises to its clients: "We dispose of the globally largest Database of Internet-users and we are able to generate detailed information about single and grouped users. We know the operating systems of our users, installed software, residence or company of the user, his on-line habits and preferences and many other interesting data" (cited from the German edition of "PC Professional" 6/1996:25f., own translation).

PC Professional (6/1996:25) therefore spoke of a "glass-user"; the built-in-pursuit via cookies became a big issue. (Other mechanisms to spy out data or to indrude ones PC are known - and applied, like Javascript or "action triggers" in Adobe Acrobat PDF, see www.aleph2.com/tracker/tracker.cgi and www.cs.wisc.edu/~ghost/index.html). The German law (Datenschutz-Recht) is clear-cut, however hardly to execute abroad. (Even AOL Germany has sold user data to US-compagnies.) The judicial aspects exemplify what globalization also means: The WWW is, to a certain degree, an extraterritorial, virtual global community, outside, better: beyond nationally binding laws and norms. The emergence of "netiquette" (see www.jura.uni-muenster.de/netlaw/) and the attempts of states to rule into the net show, at least rudimentary and within a nutshell, that globalization always tends to burst smaller sized institutional aggregates. Seen from the net, the national states are historical remainings, often competing and contradicting obstacles for more complexe and higher integrated aggregates (which is also true for the world market, the international system of finance capital and globally operating companies). However, when the state has been the institutional aggregate for national societies, what will become the instituional aggregate for the web-citizens?

Until today, the web-citizen lives (almost) without "informational rights" in the sense of an (internationally legal) inviolable privacy of data. But not only the individually attributable data of WWW-users are questioned. In modern societies, everybody leaves dozens of data-tracks behind which create perfect profiles of ones personal, economical, political, social, psychical, sanitary and sexual situation. Today, every creditcard company knows more about individual mobility, shopping habits, market and service preferences and other ways to spent ones money than sociologists do. Merge together, let us say, the data of census, of communal bureaucracy, of banks and creditcard companies, of power plants and waterworks, of insurers, social security,

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health-services and pension and ones individual life becomes highly predictable, much more precise than the estimations of Quetelet, the Gluecks, Eysenck and Herold altogether.

Famous names; sociologists should know them well. They all contributed to a sociology which was strictly based on statistics, not on surveys asking for opinions or personal attitudes. At this point, we should carry back our thoughts to the origins of sociology and we will be surprised that statistics and probabilities were the key instruments. Society and human behavior were seen as results of variables which could be investigated and influenced. The so-called "political arithmetic" by Sir William Petty (1623 - 1687) was first used for the calculation of an "medium life expectation". Together with John Graunt (1620-1674) he calculated the mortality rates (number of the deceases on 1000 inhabitant) for London. Due to the oscillations they recognized, that there are correlations between life expectation and residence. Edmund Halley (1656-1742) went on further. In 1693 he calculated "medium deathrates" for Breslau and the chances of survival of new-borns, as well as the insurance premiums in relation to age and life expectation. The Prussian armychaplain Johann Peter Süssmilch (1707-1767) applied this knowledge and tried the proof, that the infant mortality can be reduced through smallpox vaccinations. He argued that the peril to die from vaccination is essentially slighter than to fall ill as deathly at smallpox.

Daniel Bernoulli (1700-1785) based his considerations in the field of public health upon the same arguments. In addition he introduced the economical category of "benefit" (Bernoulli 1896), when he recommended compulsory vaccination to the French king: Inoculations, he argued, be then meaningful also, if thereby many babies die, if the loss works out "only on the children useless for society, whereas the valuable ages benefit" (cited after Huber 1958:91). The implicit concept was quite simple, yet anticipated Social Darwinism and eugenics: Who already succumbs the relatively slight demand through the vaccine, saves society pains with and costs for a probably anyhow weak life.

In principle, also modern societies have not solved the therein founding problem of decision-making (see Schrage/Engel 1982). Where ever costs and benefits of measures must be calculated, particularly those which influence ultimately life, health and property, humankind´s supreme interests are turned inescapably to assets (see Kunreuther/Miller 1985; Moore/Okamoto 1985). Bernoulli had made this aspect intentionally to the starting point of his "political arithmetic". His probabilistics should lead to a purely

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mathematical theory of decision-making, with which human decisions should be made assessible and evaluable in advance (Bernoulli 1896:43).

The insurance industry applied Bernoullis methods and calculus. Moreover, they promoted the development of the calculating machine and the modern social statistics. King Friedrich II (1712-1786), convinced by the clergyman and statistician Johann Peter Süssmilch (1707-1767), established "historical indices", in which the population of Prussia, the buildings and the finances of the communities were recorded. In 1805 the Statistical Bureau of Prussia was erected.

In France, Adolphe Quetelet (1796-1874) conducted the second census, out of which he tried to derive the "average Frenchman" as well as an ideal type of the "good and beauty" and the reasons for deviance and crime. Herein the nucleus of an early diagnostics may be seen, alike the one which has been developed by the couple S. and E. Glueck (1959; 1972) and later by Eysenck (1977) and Herold (see Cobler 1980; Simon et.al. 1981; Simon/Taeger 1981).

In the course of industrialization the social arithmetic went far beyond census and economical statistics. In the U.S. every ten years since 1790 a census was accomplished, to register the voters and, later on, to record industry and commerce, farms, mines and administrative units. The 10. census of 1880 had delivered so many data, that the evaluation couldn´t be finished earlier than after seven years. The need to process huge amounts of data once again promoted the development of calculating machines. Without Hermann Hollerith´s (1860-1929) data-processing-machines, which has extended Jacquard´s punch cards to tabulation of U.S. census data, neither a modern, rational industrial planning and logistics nor the "battles of materials" of World War I and II would have been possible (see Beniger 1986).

Consequently, the census of the Third Reich was the most advanced instrument to record the human and economical potential of the society in its whole. The National Socialists designed an ID-punch card for each citizen with 28 marks with about 600 punches. The owners of vehicles (cars, trucks, busses), physicians, paramedics and nurses, people with strategic and other relevant qualifications became specifically registered. The data suited for mobilization, as well as for the selection after qualifications but also after racial features.

In the face of user-profiles trough the WWW, the brief historical reminder should make sense, but also the question, which has not changed after three

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hundred years of social artithmetic: What type of data, in which quantity and quality and in which connexion do we need to enable us to govern our world rational and appropriate?

At this point methodological, epistemological and ethical aspects come into play - and, most important, the role disaster research can play. As published earlier (see Dombrowsky 1987; 1995) I have suggested to define "disaster" as empirical falsifications of our planned and intended activities. Disasters proof the fact that not everything has been under control or in a state of controllability. Most findings of the international disaster research evidence that failures are the final outcome of mistakes being joined together, of wrong decisions, operating errors, misinterpretations and misjudgements. Almost all so-called "sudden and unforeseen" outbreaks would have been correctable. Even Chernoble has had a "window of return" of about 45 minutes to regain control (see Haynes/Bojcun 1988). We have also learned our lessons with respect to so-called "natural" disasters. It is not the earth tremor which makes people die and suffer, it is the way we integrate this hazard into our life. Most disaster students agree that the severity of a disaster triggered by an earthquake depends more on cultural, economical and technical conditions and social adaptations than on its physical intensity. The primary causes lie on one hand in factors like

— "land use",
— "settlement",
— "architectural structures",
— "infrastructures",
— "energy supply, raw materials, resources",
— "metabolism with our natural basis".

On the other hand they lie in the availability of

—"preparedness, warning and protection measures",
—"rescue, relief and mitigation systems" and,
—"recovery and reconstruction capabilities and ressources".

For all these factors we already dispose of empirical data based on spatial distribution. Risk-maps and vulnerability assessment for almost all natural but also for most man-made hazards has been made (see Primer 1991). Via the WWW we can trace tornadoes along the continents, the development of desertification, of vegetation, or of water ressources. The Munich Ruck Insurance Company periodically publishes the "Worldmap of Natural Risks",

NOAA has reexamined the Yellowstone National Forest Fire on the basis of stapeling "thematic maps" derived from radar-, temperature-, wind- and humidity-data as well as from morphological, hydrological and biological data. Dynamized geographical information systems enable simulations of events (like fires or disasters) up to complexe systems like the climate or vegetation (see Andrews 1983; ASSOCIATION 1982; Bremer 1987; Bremer/Gruhn 1988; Gearhart/Pierce 1989; Litjen/Owens/Shields et.al. 1978). The net is a treasure vault of approaches, paradigms and methods with which complexe systems and interrelations could be modelled, assessed and analyzed (see http://sigma.unisg.ch/~sgzz/links/stp/futres/scenplan.htm; http://iswww.bwl.uni-mannheim.de/lehrstuhl/forschung/sd.htm). Together with these methods and approaches, we can develop a universal, standardized scheme of investigation, a net-questionaire in which all of us could fill in their knowledge of their country, the types of disaster, its occurences, severity, effects a.s.o. At the end we would have created a working Global Disaster Handbook which is much better than, let´s say the CIA Nation Reports. This idea may sound naive, however, the WWW opens up opportunities, we never had before.

That is my central thesis: Sociologists are using the net like they (mis)used the computer in the beginning as a mere typewriter. The net is much more than a library of libraries, a gallery of galleries, a videothek of videotheks or a hyperfast post office with built-in telefone and fax-machine. The net is the universal machine to generate social arithmetics, the second, virtual globe with which we can simulate a rationally planned and developed world. That is the true methodological change and challenge and a genuine opportunity too.

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