Identity and deception in the virtual community

Judith S. Donath

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Abstract

Identity plays a key role in online communities. The primary activity is information exchange and in that exchange the identity of a message's sender is one of the most important things to know. Yet identity is problematic: in the disembodied world of electronic communication, identity floats free of the stable anchor that the body provides in the real world. This paper examines the effects of anonymity and identity deception in online communities. It uses work done in the theoretical modeling of biological communication systems to evaluate the benefits and costs to the individual and to the group as a whole.

Identity and deception in the virtual community

Networked communities – groups of people who communicate via electronic group discussions – are proliferating at a great rate. These communities are interesting for a number of reasons, one of which is that they are "virtual" communities. Within the structure of the network, people are disembodied, existing almost purely in the realm of their communication signals; they are creatures subsisting on a diet of information.

In the physical world there is an inherent unity to the self. The body, problematic as its philosophical relationship to the self may be, provides a compelling and convenient definition of identity. The norm is: one body, one identity. The virtual world is different. Information spreads and diffuses. It is not like matter: there is no law of the conservation of information. The inhabitants of this impalpable space are also diffuse; there is no body to anchor identity. One can have as many electronic personas as one has time and energy to create.

"One can have...?" Who is this "one"? It is, of course, the embodied self, the body that is synonymous with identity, the body at the keyboard. The two worlds are not truly disjoint, but their relationship is murky and intricate. A single person can create multiple electronic identities, their only link their common progenitor, a link which is invisible in the virtual world. A man can create a female identity; a high-school student can claim to be an expert in virology. If the two worlds were truly unconnected, the result might be simply a wholly independent society, wherein a virtual identity would be taken on its own terms. Yet this is not the case. Other explorers in virtual space, males in the real world, develop relationships with the ostensible female, and are shocked to discover her "actual" gender. The virtual virologist's pronouncements on AIDS breakthroughs and treatments are assumed to be backed by real-world knowledge. Do virtual personas inherit the qualities – and responsibilities – of their creators? What is the relationship among multiple personas sharing a single progenitor? Such questions bring a fresh approach to ancient inquiries

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into the relationship between the self and the body – and a fresh urgency. Online communities are growing rapidly and their participants face these questions, not as hypothetical thought experiments, but as basic issues in their daily existence.

Even in today's nascent communities, one can see how technological decisions shape the nature of identity. Some systems make it impossible to trace a participant's real-life name; others try to ensure that messages are ascribed to their author's physical being – and the cultures that evolve are strikingly different. Social conventions also play a role. In some environments, people sign messages with not only their full names, but also their place of employment, job title, and phone number. Elsewhere, virtual identities are not only anonymous, but ephemeral: names are taken temporarily, characteristics have little or no persistence. Even simple design decisions, such as how prominently a writer's name is displayed, influence the ambience of an online community.

Opinion is divided as to the value of virtual anonymity. Some claim that the ability to establish an independent and disembodied identity is one of the most valuable aspect of online culture – that it allows people to explore roles and relationships that would otherwise be closed to them. Others claim that anonymity encourages irresponsible and hostile behavior and that an anonymous community is an oxymoron. Clear discussion of these positions is difficult: the issues are complex, and there are many unspoken assumptions on both sides about the nature of community and the responsibilities of the individual. A promising approach is to look at virtual communities as communications systems, the inhabitants as signallers and receivers. The costs and benefits of anonymity, identity deception, character stability, etc. can thus be discussed without relying on the vocabulary of the embodied world.

Models of honesty and deception

Theoretical biologists have developed a simple yet powerful model of the interplay between honesty and deception in a communication system. Examples of identity deception abound in the animal world. They include "femme fatale" fireflies, brood parasites such as the cuckoo and the cowbird, and Batesian mimics such as the burrowing owl and the viceroy butterfly.[1] The deception is quite harmful to those deceived, whose costs range from a lost meal to loss of life. However, it is beneficial to the deceivers, who gain food, free child care, or their own safety. What maintains the balance between honest and deceptive signalling and why, since it can be so beneficial to the deceiver, isn't deception more common? Why don't more butterflies resemble the bad-tasting monarch? And why don't weak, undesirable mates pretend to be strong, desirable ones?

There is not a simple answer to this question; there is not even agreement among biologists as to how common, or effective, is deception. If, due to excessive cheating a signal becomes very unreliable, it may simply no longer function as a signal: it ceases to convey information. Yet there are stable systems of deception, where the percentage of deceivers does not overwhelm the population, and the signal remains information-bearing, however imperfectly. And there are signals that are reliable: signals that are difficult, or impossible, to cheat.

1. Predatory female fireflies of the species *Photuris* are able to mimic the flash pattern of females in the species *Photinus*. The deceptive *Photuris* female signals, the unsuspecting *Photinus* male approaches, and the predatory female attacks and eats him. Brood parasites lay their eggs in the nest of another bird. The unwitting adoptive parent hatches the egg and raises the parasite, often at the expense of its own offspring. Batesian mimics are harmless species that imitate species that are repellent to predators or competitors. The Viceroy butterfly resembles the bad-tasting Monarch; the hissing call of the burrowing owl sounds like a rattlesnake's rattle.

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Biologists and game theorists have developed an analytical framework for modeling these systems. Of especial interest to us is the work done by Amotz Zahavi and others in examining what makes a signal reliable. Zahavi proposed the "Handicap Principle", which states that

> ...[F]or every message there is an optimal signal, which best amplifies the asymmetry between an honest signaller and a cheater. For example, wasting money is a reliable signal for wealth because a cheater, a poor individual claiming to be rich, does not have money to throw away; the message of strength may be displayed reliable by bearing heavy loads; and confidence may be displayed by providing an advantage to a rival.[2].

Signals that follow the handicap principle are called **assessment signals.** They are costly to send, with the cost related to the quality being advertised. Assessment signals are reliable, since sending an assessment signal requires that the sender possess the relevant trait. Other signals, called **conventional signals,** are less reliable. Here, the correlation of the signal with a trait is by convention or custom. The signaller need not possess the trait in order to make the signal; thus, conventional signals are open to deception.

Both assessment and conventional signals are found in most communities. According to a game-theoretical analysis, the balance of the costs and benefits associated with these signals is what determines how widespread deception is within the system. For example, the sender of an assessment signal, which is by definition costly, pays the cost of making the signal. Also, the receiver of the signal pays the cost of assessing the signal – the time and energy involved in evaluating it[3]. For example, when hiring a new employee, the text in her resume is a conventional signal, for she could write down an impressive job history whether or not it is true. Her statements during an extensive interview are more like assessment signals, for she must have actually acquired the knowledge in order to display it. It is much quicker and easier (that is, less costly) for the employer to just look at the resume, but the chances of being deceived are much higher. If the costs of deception are high – say, the job is a responsible one and an inexperienced employee may cause a great deal of harm – it will be worth making the effort to make the costlier evaluation.

There are other costs associated with deceptive signals. When a signal has a high deception rate, everyone making that signal pays some cost in not being believed. Think of the monarch butterfly. A bird learns after one bitter taste not to bite these butterflies. This protects all monarchs; it also protects the viceroy mimic, as long as there are not too many of them. If the number of viceroys (which are apparently rather tasty) gets too high, it is likely that a bird's first bite of orange and black butterfly will be pleasant. Subsequently, both monarchs and viceroys will suffer more bites. Eventually, if the rate of deception becomes very high, the signal becomes meaningless.

In social communications systems an important factor is the cost of punishment incurred if a deceptive signaller is caught[4]. Going back to our resume example, there is usually little penalty for being caught padding one's employment history when seeking, say, a waitressing job, whereas the punishment for being caught amplifying one's medical qualifications may be quite severe. A social system can add make deception more costly, thus making conventional signals more reliable.

This is only a brief outline of biological signalling theory. It is enough, however, to provide a useful foundations for our analysis of identity and deception in the online community. In the world of biology, changes in signalling behavior may occur quite slowly, over evolutionary time. In the world of human interaction, changes can occur quite quickly for the communication

2. Zahavi 93b
3. Dawkins & Guilford 91
4. Hauser 92

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environment is quite mutable. If excessive deception makes a signal lose its meaning, it can be replaced by a more reliable assessment signal or the community may begin to punish deception. In the virtual world, both the participants and the environment itself change: the participants establish new styles of interaction and the environment evolves as it is further designed and developed.

The purposes of news

The focus of this essay is on Usenet newsgroups. Although technically simple – they are essentially structured bulletin boards – a complex social structure has evolved. The newsgroups themselves are quite diverse, making it possible to see how different goals and interests affect the role of identity in a community. First, we will discuss why people participate in the Usenet community; we shall then take a close look at the means available in this environment for establishing identity; and finally, we will look at the effects of specific technological developments.

Usenet newsgroups are forums for discussion and the exchange of information. There are several hundred discussion groups, covering topics ranging from computer networking protocols and integrated chip design to gun-control and vegetarian cooking. Some groups function mainly as places to exchange information, repositories of knowledge where one can submit a question and receive a (possibly correct) answer. Others function more as social venues, places of "affiliation" where people come to discuss common interests[5].

The name of the group describes the topic: *comp.dsp* is for the discussion of computational digital signal processing; *soc.culture.magyar* is for discussion of Hungarian life, language, and politics.The groups are arranged in a hierarchy, with the first word specifying both the subject-matter and the tone of the subsumed groups. Thus, the groups starting with *sci* are scientific in nature and factual in spirit, *soc* groups are about society, *comp* are technical forums for computer related issues. Creation of new groups is done through a formal procedure, except for those in the *alt* category (*alt.music.bela-fleck, alt.sex.bondage, alt.atheism*) which can be created by anyone and tend to be wide-ranging and informal.

This range of topics and styles makes Usenet news an especially interesting focus for this study. Although all share the same technology and interface, the social mores – e.g. writing style, personal interactions, and clues about identity – vary from forum to forum. Furthermore, Usenet news is accessible by millions[6] of people all over the world. Originally, the subscribers to Usenet news were primarily researchers in universities and places such as Bell Labs and NASA. Now, the subscribers range from the highly technical to the computer illiterate, from young children playing with their parents' account to homebound elderly people using the Net for social contact, from young American urban professionals to radical Afghani Muslims.

People participate in Usenet newsgroups for a variety of reasons. They may be seeking information or companionship, advocating an operating system or a religion. As in the real world, their motivations may be complex: both the desire to be helpful and the desire to be noticed may prompt one to write a lengthy and detailed exposition. A full accounting of the reasons why people participate in these groups is not possible, for it is tantamount to asking why people communicate. Yet a general outline of the readers and writers' motives is needed to evaluate the costs and the benefits of identity deception within this community.

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5. Sproull & Faraj 93

6. News is accessible by anyone with Internet access. How many people that is at a given moment is debate-able, but it is agreed that the number is growing exponentially. (Oct 1994 estimate 13.5 million: should update this number as close to publication as possible - could be 10x or more this number by 1997).

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The active participants - those who write - form the core of the Usenet community. People write Usenet postings for a variety of reasons. They may be seeking a specific piece of information or a supportive community; their motivations may range from altruism to harassment. For some, it is a matter of relative indifference whether the readers are aware of their identity; for others, the readers' awareness – or ignorance – of their identity is the main point.

There are also a large number who read the posted articles, but do not contribute any themselves. Known as lurkers, they are an invisible segment of the community, for presence is palpable only through writing. For Usenet to function, both writing articles and reading them must be beneficial. Most people read much more than they write: if reading the news ceases to be informative or entertaining, one ceases to participate altogether. And, if no one is motivated to write, there is no news.

Information requests

A very common genre of Usenet letter is a request for information: can anyone suggest a good restaurant in Lisbon, or remember the name of this poem, or figure out what is wrong with this code.

Making the request is not itself the goal: the writer is hoping to benefit from the elicited responses. The requester's identity may determine whether others deem it worthwhile to answer and how they phrase their response. A request from a prominent participant may garner more responses than a similar request from an unknown. Yet status within the group does not guarantee favorable response. For instance, a request for basic advice from a novice may be answered, while a more seasoned participant might be expected to know better (Usenet etiquette warns against using the Net simply as an easy source of quick answers). Indeed, with any letter that invites an answer, the writer's perceived motivations, level of knowledge, history with the group, and real-world status all affect how the potential respondents interpret the content and what benefits they believe will be gained by answering.

Information gathering

Exchanging information was the original purpose of Usenet and remains an important function. How beneficial information is to the reader depends upon its relevance (if one has no interest in, say, scuba diving, information about underwater breathing techniques has no value) and its truthfulness (one may be very interested in scuba-diving, but incorrect advice about how to clear air passages is quite harmful).

Knowing the identity of the information's source is a key factor in evaluating the veracity of the information. We may believe a story if it was published in *The Wall Street Journal* and dismiss it if it appeared in *The National Enquirer*. With Usenet, there is no editorial board ensuring standards of reliability: the sole source of each posting is the writer. Thus, the writer's identity – in particular, claims of real-world expertise in the subject or a history of accurate online contributions – plays an important role in judging the informational content of an online article. Similarly, knowing the writer's motivation – e.g. political beliefs, professional affiliations, personal relationships – can influence how we interpret the meaning of a statement. (Of course, the statements that give an author credence in one reader's eyes may cause another to dismiss him as a crackpot).

The cost of identity deception to the information-seeking reader is potentially quite high. Misinformation, from poor nutritional advice to erroneous interpretations of drug-smuggling law, is easy to find on the net – and is more likely to be believed when offered by an "expert".

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Affiliation

Usenet has become a social institution: people participate in it to find support and friendship. Many newsgroups function as communities, in which the participants share common concerns and interests. These include groups for people with common hobbies (there are 500 groups in the recreation hierarchy, such as *rec.gardens, rec.running, rec.collecting.stamps*); common concerns (including *alt.support.hemophilia, misc.kids.vacation, soc.support.transgendered*); and common cultures (from *soc.culture.scottish* to *alt.music.gdead*). The sense of shared community – finding friends, not being alone – benefits both the readers and the writers[7]. It requires that the participants be sympathetic to the ideas around which the group is based; even if they disagree, there needs to be some fundamental common ground. Thus, trust is essential, in particular, trust in the identity of the other members of the group[8].

Here, the invisible readership – the lurkers – is especially problematic. The tone of many social groups is of a gathering a peers, of people sharing a common problem. If no discordant voices are heard, it is easy for the participants to believe that their discussion is occurring in a protected and sympathetic niche. Yet this need not be the case: anyone can read any group and there may be any number of readers whose motivations for perusing the letters may not be what the authors prefer.

Entertainment

For many, reading news is a diversion and the atmosphere in many newsgroups has been likened to a pub: they are places where people banter and gossip. The reader who comes seeking entertainment has invested much less in the veracity of the articles than has the seeker of truthful information or authentic community. Thus, the authors' identities and motivations are less important (and any deception less costly) when the reader's motivation is entertainment.

For the writer bantering in the online pub, the costs of deception are potentially higher. The writer invests more effort than the passive reader; the writer is also vulnerable to the social costs of being publicly fooled by a troll[9] or similar deception.

Both the entertainment seeking reader and writer can be detrimental to others. Although unseen, the readers perusing *alt.support.big-folks* to laugh at the fat people is not the ideal support community. See *Boundary establishment*, page 8 below, for an example of the deceptive entertainment seeking writers.

Belief dissemination

It is easy to imagine why people may seek information on the net: they have a problem and would like solution. What prompts someone to answer? Why take the effort to help an unknown and distant person? One answer is altruism: people feel a desire or obligation to help individuals and to contribute to the group. Yet selfless goodwill alone does not sustain the thousands of discussions: belief dissemination and reputation building provide a great deal of motivation.

Passionately held beliefs are debated at great length on the net. Politics and religion, well-known antidotes to polite conversation, are the mainstays of the *soc.** hierarchy. A quick look finds debates about the legitimacy of a recent *fatwa* in *soc.culture.lebanon*, about the religious status of children from mixed marriages in *soc.culture.judaism*, and about the rights of birth parents in adoption in *soc.women.* Of course, one need not be in the midst of an argument to attempt to

7. Sproull & Faraj 93
8. Beniger 87
9. see page 15

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persuade: any statement that contains an opinion can be said to have belief dissemination as a goal. And opinions are freely offered on Usenet: what c compiler to use, where to ski in Utah, how get your cat to stop eating your plants.

The writer's identity provides an important context for the message: Is the persuasive post on *comp.languages.c* about the virtues of a new compiler coming from a programmer who has evaluated its code output or from a marketer of the product? Has this writer previously recommended ski resorts you know you don't like? Note that sometimes the writer's group identity – e.g. place of employment – provides the relevant context, while at other times it is the identification of a specific individual and his or her historical behavior that pertains. For the writer attempting to persuade, the goal is to appear believable.

Reputation building

In most newsgroups, reputation is enhanced by posting intelligent and interesting comments. Reading almost any newsgroup reveals that a relatively small number of people do much of the writing; their names - and reputations - are well-known to the readers of the group. Some people expend an enormous amount of energy on a news group: answering questions, quelling arguments, maintaining FAQs[10]. To the writer seeking to be better known, identity is especially important, for if the readers are oblivious to who the is author of a particularly well-crafted letter, there is no gain in reputation.

In the real world discussion, high status is correlated with being vocal - and a high status member will often dominate a group discussion even when others are more knowledgeable. Sproull and Kiesler demonstrate that such status effects are weaker in online groups[11]; both the asynchronous format and the lack of status cues contributing to wider participation. However, Usenet readers choose which contributions they wish to read – and many make that decision based on authorship. The lowest status - the outcast - is the participant banished by killfiles[12]: he or she can speak all they wish, but will not be heard.

Identity experimentation

Identity experimentation – from attempting to pass as the opposite gender to creating an alter persona to enjoying the freedom of speaking from behind an anonymous screen – is for many a goal in itself. Such assays are often quite enlightening to the experimenter, who may learn something of what it means to be someone else – or for the first time be able to fully express him or herself.

The example of gender experimentation is frequently cited[13] and it is an interesting one to look at in terms of our signalling model. While in the real world, gender deception takes a great deal of effort, in the online world it is simple: use a name typical of the opposite sex. This is a classic conventional signal: linked with the trait it represents only by association; it is easy to perceive, easy to mimic. For the initial experimenters, the results are dramatic. They encounter reactions and behaviors they had never before seen – at least not from the receiving end. Eventually, however, the community recognizes that many participants with women's names are in fact thinly disguised men. Presenting oneself as a member of the opposite gender requires more

10. A FAQ (Frequently Asked Questions) is a document that contains many of the facts and anecdotes relevant to a group; their purpose is to answer these questions before they are asked - yet again - in the newsgroup. A FAQ may be quite long - some are over 100 pages – and are quite an effort to create and keep up to date.

11. Sproull & Kiesler 91, p. 60.

12. A killfile allows you to automatically skip over postings from people you wish to ignore.

13. See Curtis 92 or Stone 92a for gender examples from MUDs and chatrooms.

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than the simple name switch; acting the role requires much more effort. Discovery of the deception usually occurs because the gender pretender misses some essential cues, from overacting the part, to interacting in a way more typical of his or her real gender. In forums where the deception rate is high, name eventually ceases to carry meaning about one's actual gender. Where the deception rate is high and the cost to receivers is high – for instance, a social environment in which one might find oneself flirting with a person of the "wrong" gender – various measures may be taken to lower the deception rate, by raising the cost of being caught. Online, such costs can include being publicly rebuked or ostracized. How well these costs work as a deterrent depends up the value of the online persona to the real-world person. If the persona is of little value, it can simply be discarded; the use of transient personas gives their creator little motivation for avoiding the costs of discovery.

Boundary establishment

There are no boundaries in Usenet. Anyone with Internet access can write to it. Boundary violations[14] – from off-topic discussion to net-wide mass mailings to personal harassment – is not uncommon, in part because the perpetrators feel impervious to punishment: unseen, incorporeal and, in some cases, anonymous, there is nothing there to be caught.

Many cases of harassment and malicious activity online are due to the virtual equivalent of a group of bored teenagers out for an evening of petty larceny and disturbing the peace. There is, for example, an ongoing "invasion" of the cat-lover's newsgroup. *Rec.pets.cats* (r.p.c) contains advice on cat-care and a great many tales of the "my kitty just did the cutest thing" variety. *Alt. big-foot* is a newsgroup that has as one of its goals: "To *collectively* target enemy individuals and "put them in their place".[15] They choose *r.p.c* as the target and proceeded to bombard it with messages about torturing cats, dead cats, things to do with dead cat parts. The regular *r.p.c.* participants were not amused; indeed, they were extremely upset. At first, they answered back, which simply served to fill their newsgroup even more with off-topic postings. Soon, someone introduced killfiles to the group and they were able to ignore postings from the known harassers; then the members of *alt.big-foot* started using false names and inviting similarly minded entertainment seekers from other groups to join in. In January 1994, the Royal Canadian Mounted Police were called to investigate a posted story of cat killing. The was no cat, it turned out, but its inventor was warned - in person - to desist.

Those seeking to stop such activity need to identify the offender. If they are seeking punishment, they must be able to connect the online activity with the real-world person – someone who's system-administrators or boss or local policeman can mete out whatever penalty is required. Even if they are only seeking respite from the annoyance, they must at least be able to identify the on-line offender the next time he or she appears – which may be difficult if a new guise is often used.

Rec.pets.cats was defending its boundaries. And so, in its own way, was *alt.big-foot*:

> Rituals too can help define the identity of a group not only by excluding non-members from participation but also by symbolic attacks on the enemies of the community.[16]

Groups such as *alt.big-foot* have little reason for existence other than to be a group. They have no specific topic of discussion; their goal is to provide a sense of belonging, of being in where others are out.

14. See Kollock & Smith 95 for an in-depth analysis of Usenet boundaries
15. "Alt.Bigfoot FAQ", http://www.io.com/~wilf/bigfoot/bigfoot_faq.html
16. Burke 93

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The many purposes of news

The motivations for reading and contributing to Usenet news are many and varied – and sometimes at odds with each other. Whether one benefits from a deceptive self-presentation, and whether that deception is harmful to others, is very dependent on context and circumstance.

Furthermore, which aspect of identity is important also varies. Sometimes, it is the ability to connect an online name with a specific real-world person. Sometimes, it is more relevant to know something social role or knowledge or interests, without necessarily learning a person's name. And sometimes, it is important to recognize an online persona as a specific individual, without needing to connect the persona to his or her behind-the-scenes progenitor.

We have discussed a variety of motivations for participating in the Usenet community and looked at how the role of identity plays in several contexts. We now look at how identity is established online and under what circumstances is identity deception possible.

Establishing the online identity: the anatomy of a Usenet letter

Within the Usenet community, the letter, or posting, is the basic form of communication. In it, the writer's identity is expressed in various ways. Example 1 is a typical Usenet letter. The writer is offering advice in response to a request for information. Someone following this advice assumes that "Owen Koslov" (names and other identifying features have been changed) knows what he is talking about. What does the reader of this posting know about Mr. Koslov? Clues can be found in each part of the letter: the header provides the writer's name and email address, the signature adds further information about online presence, the body of the letter reveals voice and something of the history of the exchange. In this section, we will take a close look at the anatomy of a Usenet letter and at how identity is established or concealed within it.

Header

ctract from previous message

Message body

Signature

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Owen@netcom.com (Owen Koslov)
Re: Brine Shrimp
Mon, 24 Jan 1994 09:38:23 GMT

Newsgroups: sci.aquaria,rec.aquaria

In article llawrence@aol.com (Leo Lawrence) writes:
>I tried to hatch some brine shrimp for my fish. I could only get
the
>shrimp to live for 2 days. Could someone tell me what to feed
them and
>give me details on hatching them.

You are not supposed to keep them alive for longer than a day or
so. They should be fed to the fish as soon as they hatch. Other-
wise, you need the type of set up you'd expect in a regular salt-
water tank: low bio-load, plenty of water circulation, and
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Example 1 *A Usenet letter*

The header

The header is automatically inserted by the posting software. It provides the most straightforward form of identification: the writer's name and email address. This data appears in the article lists readers skim to find postings of interest; it is the data used in killfiles to identify writers one finds onerous. The header often provides the only identification in a posting, for many people do not sign their writings – in many cases, because it is redundant with the supplied header data.

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One of the most informative pieces of data in the header is the location of the account. A posting about oceanography has added authority if came from *whoi.edu* (Woods Hole Oceanographic Institute) as does one about upcoming Macintosh products that came from *apple.com*. These addresses are what I will call institutional accounts: online addresses from research labs and corporations, given to people associated with the institute. Although the name of the individual writing the posting may be unfamiliar, the name of the institute is not. Like notes written on letterhead, a posting submitted from a well-known site shares in its reputation.Yet not all postings are from recognizable institutes. Some are from small businesses unknown to the reader. And an increasing number are accounts from commercial service providers, somewhat like electronic post office boxes. Unlike the institutional accounts, these commercial accounts do not imply any affiliation: they simply mean that the user has signed up for the service.

For years, access to the net was limited to researchers and academics. The opening up of the online world to anyone with a computer and modem has met with quite a bit of resistance from the original residents. Most maligned are newcomers who have accounts with the consumer-oriented services such as Prodigy and America Online (AOL). Postings with *aol.com* addresses are sometimes greeted with derision and newsgroups such as *alt.aol-sucks* exist solely to spurn America Online subscribers. This resistance is partly a reaction to the loss of exclusivity – access to online communication no longer means one is at the forefront of technology – but there are also substantive differences between the postings of the old guard and the newcomers.

Some of the differences are stylistic. The consumer-oriented services offer their own communication forums in which the conversational style and conventions are quite different than Usenet's. For instance, in an AOL chatroom, it is fine to simply respond "yes" to a statement. On Usenet, because each statement is a stand-alone posting, it is considered poor manners to post a response with no added content and with no indication of the original statement. Newcomers to Usenet from AOL, accustomed to chat-room style interactions, frequently post one-word rejoinders, infuriating other Usenet users and adding to the image of AOL-based participants as thoughtless and ignorant of local customs.

There are also differences in accountability. At one end of the spectrum are the institutional accounts given to members of the community – students, staff members, or other affiliates. Here, the user has reasons, such as a job or degree, for remaining in good standing with the account provider. A user who engages in malicious or illegal activity online stands to lose more than just the account: a number of students have been disciplined – and some expelled – for violations of institutional policy. The relationship of a subscriber to a commercial service is much looser. While most services have policies about what constitutes acceptable behavior, the repercussions for infractions are limited to termination of service – an inconvenience, certainly, but not the equivalent of demotion or firing.

At the opposite end of the spectrum are services which maintain only a tenuous connection between an account name and the corresponding real-world name, making it easy for their subscribers to create multiple, fictitious names and to keep their real names from appearing on their postings. Furthermore, advertising promotions giving away free limited-time accounts have made it very easy for people to obtain temporary, anonymous Internet access. AOL, for instance, both makes it easy for people to appear under multiple names and it gives away start-up packages by the thousand; it is rare to see an AOL posting with anything resembling a real name attached to it. The anonymity of these accounts makes them popular for disruptive and harassing postings.

Truly anonymous postings can be sent using anonymous remailers. These are forwarding services which will strip all identifying information from a letter and then forward it, anonymously

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or under a pseudonym, to the intended recipient or newsgroup. The header added by most such remailers clearly indicates that the posting is anonymous: *anon1234@anon.penet.fi* and *anon-remailer@utopia.hacktic.nl* are typical. While remailers can be used maliciously, their primary use is to provide privacy: anonymous posts are common in groups where the participants reveal highly personal information. Use of an anonymous remailer can also be a political statement, an affirmation that one supports citizen's right to privacy (which includes anonymity, access to strong encryption tools, etc.) and opposes government and corporate surveillance.

As the net grows, the meaning implicit in account location changes. No longer does a posting from a research lab mean that a researcher sent it: support staff as well as scientists have computers and the posting from Woods Hole may be from a prominent oceanographer – or a temporary receptionist. And, as we have seen with America Online, affiliation with a particular commercial service can also carry meaning. It need not be negative: service providers such as the Well in San Francisco and Echo in New York are known for attracting a recognizable community: the Well's image is tie-dyed, politically active, and listens to the Grateful Dead; Echo's is black-clad and arts-oriented.

Today, header information is becoming less reliable. For years, one had to be fairly knowledgeable in order to fake the information in the header. Now, posting from a non-existent address – or impersonating someone else – is fairly easy: many programs simply let the writer fill in the name and address to be used, rather than automatically extracting them from the account information. While the astute examiner might detect suspicious anomalies in the routing data (the record of how the letter passed through the net), few people are likely to look at a letter so closely - at least not until they have become suspicious about its provenance. The header, in other words, is becoming a conventional signal.

Still, the vast majority of Usenet postings appear under unaltered names. The name and address written in the header remains the basic piece of identifying data.

The signature

Unlike the header, the signature is added at the discretion of the user. It may be an electronic business card, an elaborate work of self-expression, a cryptic remark, or simply a name. Not everyone uses one, and they are far more prevalent in certain forums than others.

Signatures can be used to anchor the virtual persona to the real world person. The net is a great leveler: no one knows if you are male or female, boss or underling, gray-haired or adolescent; "on the Internet, nobody knows you're a dog". This is not to your advantage if in the real world you hold some authority: no one can see that you are a respected professional at work in your office, not a teenager logging in from a bedroom. One use of the signature is to present real world credentials: your full name, title, department, office phone number; enough information so that someone could, if they were curious, check to see that you were really who you claimed to be. Such business-card signatures are common in the technical newsgroups. Advice from someone who's job title is "Unix System Specialist" or "Director, Software Development" has added weight, particularly if it is in a known and respected company (for the important sounding "Director of Software Development" at unknown "ABC Software Co." may be also be the founder and sole employee). These signatures imply that the writer is posting in his or her official, employed capacity - willing to publicly stand behind the advice.

One newsgroup that contains many business-card signatures is comp.security.unix. The discussion here is about how to make unix systems secure - and about known system flaws. While many of the participants are system administrators of major institutions, others are just learning how to set up a system in a fledgling company and some, of course, are hoping to learn how to

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break into systems. Someone posting a question may wish to include credentials to assure potential responders that the question is legitimate, not a disguised dig for information from a would-be hacker. And, a posting suggesting that administrators improve their sites by changing this or that line of code in the system software could be a furtive attempt get novice administrators to introduce security holes; a signature verifying the legitimacy of the writer alleviates this suspicion. Identity deception is a big concern of the participants in this group, and they are very aware of signatures and their implications. In an exchange concerning how to determine if an email message is "fake" one writer suggests:

> Fakemail is usually without a "subject:" and also without a .signature at the end (so, if you know the person you may be able to know that it's not them b/c no .sig is there).

Here, the signature is regarded as part of one's characteristic online appearance.

An important new use of the signature is to refer to the writer's home page on the World Wide Web (see *The Web*, page 16). Like the business card signature, the Web address may contain credentials – and much more. A home page may provide a detailed portrayal of its subject: people include everything from resumes and papers to photographs and lists of favorite foods. A person's presence on the Web has depth and nuance not found in the ephemeral Usenet environment and a writer's self-presentation on the Web can provide a very enlightening context for understanding his or her postings.

A common use of signatures is to add a disclaimer, saying something to the effect that "These are my opinions and not those of my employers". For many people, participating in Usenet newsgroups occupies a sometimes awkward position between work and private life. The newsgroups may be an important resource for one's work; they may also be a purely recreational past-time. Whether a posting is about signal processing or Argentinian culture, if sent from one's work account it will show up under the company's electronic letter-head. The disclaimer proclaims that the writer is appearing as himself, not as an official company spokesman.

Signatures are also used to establish one's ties to online groups. Many signatures contain computer jokes and phrases, showing that the writer is a programmer – a member of the old guard of the net.

a) Christopher Nielsen NCA&L
Systems and Network Administrator Buffalo, NY
(enkhyl@computel.com)#include <stddisclmer.h>

b) Write failed on /dev/brain: file system full

c) Doom: 5% Health, 0% Armor, 59 cent Tacos, Lets Go!

d) Dave Mescher dmescher@csugrad.cs.vt.edu
GCS d H>+ s+:- g+ p3 au a-- w+ v,--->! C++++,++ UU++++,A$ P-- L-
3- E--- N++ K- W--- M V-- po Y+ t--- 5 jx R G+ !tv b++ D- B---
e+,* u+ h- f+ r(+,++)@ !n,--- y?

Example 2 *Programmer signatures*

In a), the phrase #include <stddisclmer.h> uses a *C* language construct to make a reference to the disclaimer signature. It has both the effect of being a disclaimer (the writer is not speaking officially) and of proclaiming the writer's affinity to the C programming world. b) uses the format of a common Unix error message. For the Unix-literate reader, the phrase is familiar and the joke obvious; for others it is simply obscure. Similarly, c) plays off the scoring style of the popular computer game Doom. Signatures such as these are often individual creations, meant to be used only by their author. Since one needs to be familiar with a subculture in order to make a joke in its vocabulary, these signatures, when original, show their author's familiarity with the programming world. Furthermore, the world in which they are used is small. A writer who simply copies the clever phrase of another is likely to be quickly come to the attention of the potentially irate creator.

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The possible cost of copying – public humiliation through accusations of plagiarism – is quite high. (Smitten by a phrase too witty not to use, some writer's have taken to using other's signatures – with attribution.)

The signature in d), which includes the writer's "Geek Code" is a bit different. Proclaiming one' s "geek identity" – both one's identification with geeks as a group and one's particular and individual type of geekiness – is the purpose of this code:

> How to tell the world you are a geek, you ask? Use the universal Geek code. By joining the geek organization, you have license to use this special code that will allow you to let other un-closeted geeks know who you are in a simple, codified statement. [17]

The Code consists of a series of descriptive categories and modifiers. The first category is G, Geek type. GCS stands for Computer Science Geek (GSS would be Social Science Geek). The second category, d, is for dress style. In the example above d is without modifiers, meaning: "I dress a lot like those found in catalog ads. Bland, boring, without life or meaning". There are many possibilities, ranging from "d++: I tend to wear conservative dress such as a business suit" to "!d: No clothing. Quite a fashion statement, don't you think?". The Geek Code can become quite complex. For instance, the modifier ">" means moving towards. Thus, the symbol H>+ above is interpreted as someone whose hair (H) is striving to achieve (>) shoulder length (+). The Code is full of inside jokes, e.g. !H, the code for baldness, refers to the computer language convention of ! meaning negation. It is also full of cultural references: to operating systems, to Internet personalities, to TV shows and to various games. One has to be quite dedicated to decipher a Geek Code, but its primary message – identification with the online "geek" world – is easily perceived by anyone who knows what a geek code looks like.

Some signature styles are unique to particular newsgroups. They may refer to the writer's role in the group. For example, *soc.couples.wedding* is a newsgroup devoted to planning weddings from the fine points of invitation writing protocols to advice about how to deal with hostile in-laws. The participants include people (mostly, but not entirely, women) who are engaged to be married, people who would like to be engaged to married, and people who like giving advice. The brides-to-be are the central group: they ask questions, they share their experiences, they write to complain about their caterers, bridesmaids and future mother-in-laws. And they have developed their own signature pattern:

> Joan (and Mike, May 27, 1995)
> Amy (& Chris Sept. 7, 1996)

A similar signature pattern is found on *misc.kids.pregnancy,* where the expectant mothers sign with the baby's due date. These signatures show the special status of the writer: as bride- or mother-to-be, her real world situation is the focus of the group's interest. The signatures also highlight the temporal nature of this identity. The readers know the stages of wedding preparation and pregnancy. Responses to letters often include references to the signature ("June 10th - I'm getting married the next day! Are you nervous yet?") even if the body of the letter was unrelated to the writer's wedding.

An especially well-defined community has emerged in the group *rec.motorcycle*s, where an online club, called the Denizens of Doom (DoD), has formed. The DoD began as a satire of the newsgroup and of real motorcycle clubs, but is now a real club, with memberships lists and real-world badges. Members get DoD numbers, which they use in their signatures. One must apply for

17. Robert Hayden, "The Code of the Geeks", http://krypton.mankato.msus.edu/~hayden/html/geekcode.html, 1995.

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membership, and, while the procedure is not terribly secret, it does take a bit of knowing who's who in the group to apply: a DoD number in a signature means that the writer is not a newcomer to the group. Here is a signature from *rec.motorcycles*:

> whiteb1@aol.com (Ben White)
> AMA # 580866 COG # 1844
> DoD # 1747 Better watch out, He turned me loose!
> '95 VFR 750 5 bucks more, I coulda got a red one
> '85 Shadow
> No more Connie

In addition to the DoD number, it features the writer's membership in the American Motorcycle Association plus the motorcycles he owns (or used to own); here, the signature functions as a virtual world substitute for the colors and badges of real-world biking.

Finally, signatures make it easier to quickly identify the writer. In the uniform environment of ASCII text, there is little to visually distinguish one letter from another. Signatures are easily recognized, identifying the writer at a glance.

The signature, itself an easy to mimic conventional signal, is often used as a means to link to more robust and reliable indicators of identity: real world contacts or published Web pages. Within the virtual world, one of its main purposes is to show the writer's affiliation with a subgroup: geeks, pregnant women, virtual gangs, etc. The primary requirement for using them is to wish to publicly proclaim one's affiliation with the group, though some, such as the motorcycle DoD numbers, are themselves proof of greater commitment.

The body

The header and the signature may provide name and location; this is identity in the sense of distinguishing a singular and constant individual. They may provide some information about professional and social affiliation; this is identity in the sense of social role. To get a deeper sense of who the writer is – identity in the sense of a known individual – one must look at what he or she has to say.

Going back to Example 1, from the header and signature we know the writer's name (Owen Koslov), we know that he writes both from home (as owen@netcom.com) and from work (okoslov@veritas.com). Neither location tells us a great deal about the author - netcom is a commercial service provider and veritas.com is not a well-known company. The writer's history on the net reveals much more. A look at recent articles shows that he is a fairly frequent writer, not only on *sci.aquaria*, but also on the closely related groups *rec.aquaria* and *alt.aquaria*. Indoor aquaria seem to be his passion. He provides a fellow killifish fancier with the address of a mailing-list devoted solely to killifish. He writes several letters a day on aquaria related topics. We learn that he has perhaps too many fish: "I wish I had your discipline in keeping the number of species down. I have 9 species of lampeyes alone..." His letters are usually answers to questions posed by others, his voice is usually authoritative, occasionally dryly humorous. Here are selections (ellipses mine) from his response to someone who said to avoid charcoal in tanks with plants.

> While activated carbon does adsorb more than just organic carbons, a categorical statement like that is inaccurate. Carbon may remove some trace minerals, but I challenge you to substantiate the statement that it is a "bad thing" for live plants. … Further more, Dick Boyd's Chemi-Pure uses activated carbon as one of its ingredients and I am yet to hear one credible report of it negatively affecting live plants. The late Dr. Bridge had used a mix of activated carbon and peatmoss as a filtration medium for his planted show tank and reported excellent results.

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Over time, the frequent contributors to a newsgroup creates a strong impression. The reader of *rec.aquaria* is likely to be familiar with these postings and has come to some conclusion about the reliability of Mr. Koslov's advice.

Writing style can identify the author of an posting. A known and notorious net personality hoping to appear online under a fresh name may have an easier time disguising his or her header ID than the identity revealed in the text. The introduction to the cypherpunks newsgroup includes this warning:

> The cypherpunks list has its very own net.loon, a fellow named L. Detweiler. The history is too long for here, but he thinks that cypherpunks are evil incarnate. If you see a densely worded rant featuring characteristic words such as "medusa", "pseudospoofing", "treachery", "poison", or "black lies", it's probably him, no matter what the From: line says. [18]

Not all deceptive postings are so easy to spot. In the spring of 1995 a new user appeared in the wedding news groups. She signed her letters Cheryl, the name on her account was ultimatego@aol.com and her letters espoused a rigid interpretation of formal etiquette. The discussion in these groups is often about how to have a wedding on a limited budget. When the women would talk about using balloons for decorations, Ultimatego would post that balloons were vulgar; when the discussion turned to do-it-yourself laser-printing she would interject that only engraving is acceptable to people with taste. Some readers were intimidated by her intimations of upper-crust social knowledge; others were infuriated by her condescending remarks. When she wrote that people who could not get married in full formal splendor should not have a wedding at all but should simply go to city hall, an intense and angry exchange ensued. At this point, someone said that Ultimatego was probably a troll.

> Are you familiar with fishing? Trolling is where you set your fishing lines in the water and then slowly go back and forth dragging the bait and hoping for a bite. Trolling on the Net is the same concept - someone baits a post and then waits for the bite on the line and then enjoys the ensuing fight. [19]

Trolling plays with the image readers have of other participants. There are three common reactions to troll-like posts: some try to be helpful, for they assume that the writer was simply naive and unaware of the groups customs and mores; some get angry; and some declare the post the work of a troll. All three can be true. In a group that has become sensitized to trolling – where the rate of deception is high – many honestly naive questions may be quickly rejected as trollings.

Language itself is an important indication of group identity. "[R]egarding group membership, language is a key factor - an identification badge – for both self and outside perception." [20] Language patterns evolve within the newsgroups as the participants develop idiosyncratic styles of interaction - especially phrases and abbreviations. Some are common to all groups: BTW, IMHO, YMMV[21]. Others are of limited extent: ONNA, MOB[22]. New words are coined and ordinary words gain new meaning: flame, spam, troll, newbie. Using these phrases expresses ones identification with the online community – it is akin to moving to a new region and picking up the local accent.

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18. "About Cypherpunks". http://www.csua.berkeley.edu/cypherpunks/mailing_list/list.html
19. *soc.couples.wedding* newsgroup
20. Saville-Troike 82, p. 201
21. By the way. In my humble opinion. Your mileage may vary.
22. Oh no not again (on *misc.kids.pregnancy* used by women who were trying to get pregnant to report the monthly disappointment). Mother of the Bride.

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The language of the newsgroups is also the language of the real world: one can try to hear, from the intonation implicit in writing, the user's voice – is at a man or woman? a southerner? someone shy or strident? a young student? The message, however, may be a confusing one. One may interpret a message filled with poor spelling and terrible grammar to mean that the writer is illiterate; one cannot hear the heavy accent. Participants throughout the virtual domain say it is very disorienting not to know someone's gender. The virtual world, with its reduced cues and free-form communities, presents ambiguities unknown in the real world.

The evolving virtual world

The online environment is changing – the number of people with net access is growing rapidly and new technologies are emerging that affect the way identity is portrayed online. Usenet news will not be viable forever, but it is likely to remain an important mode of information exchange and social interaction for quite some time. In this last section, we look at two technological developments that can greatly affect the evolution of virtual discussions.

Digital signatures

A particularly costly form of identity deception is impersonation. If I can pass as you, people will confide in me as if I were you; I can wreck havoc on your reputation. With identifying information such as the header becoming increasingly easy to fake, the possibility of impersonation accompanies any establishment of an online presence.

Spurred on by the need for authentication for virtual monetary transactions, various forms of digital signatures are appearing[23]. A digital signature can ensure that a message has not been altered since it was signed. And, given various levels of certification, it can ensuring that an online person is indeed who he or she claims to be. (Interestingly, the certification of identity is personal trust. Individuals vouch for individuals and theirs personal guarantees become a part of one's digital signature. If I don't know any of the people who vouched for you, the guarantee is meaningless.).

Digital signatures provide a technological anchor for identity. They are currently rather difficult to use, though this is a problem more of interface than underlying technology. As encryption and decryption become an integrated part of the virtual environment, the appearance of a real, vouched-for persona may begin to differ markedly from other, more ephemeral beings.

The Web

The World Wide Web (WWW), originally meant as a means to distribute physics papers, has swiftly evolved far beyond its original academic domain: the Web contains short stories, reference manuals, price lists, pornographic pictures, classroom assignments - the list is growing to encompass every aspect of human endeavor. Its emergence as a social technology is marked by the rise of the personal home page as a necessity of online presence.[24]

Home pages vary greatly. Some are elaborate creations, others simply a few links and an apology for the meagre offerings. Some are stiffly formal, reading like the cover letter to a resume while others are almost embarrassingly personal, detailing the owner's emotional states and family psychodramas. People use them to present their credentials – whether as established research scientists with impressive vita's and selected bibliographies or as electronic trend-setters with eclectic web links and obscure lists of outrageous bands.

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23. See Garfinkle 95 for a full technical exposition

24. Donath 95

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The home page is fast becoming one's online self-presentation. Like one's self-presentation in the physical world, it is open to a wide range of interpretations. Erving Goffman, in his classic work *The Presentation of Self in Everyday Life* distinguished between the "expressions given" and the "expressions given off". The former are the deliberately stated messages indicating how the one wishes to be perceived; the latter are the much more subtle – and sometimes unintentional – messages communicated via action and nuance (Goffman 59). These messages are also uses to establish and reaffirm ones position in a social group. And it is these subtle messages that often provide clues that something is not quite right – that there is some inconsistency, a wrong note – in someone's claims of identity. Home pages are beginning reaching the stage where one can read from them not only the expression given by their author, but the expression given off. As the technology improves and as the pages become more common, the ability to "people-watch" in cyberspace will grow.

The complex self-presentation established on the Web is not a disposable persona. It may be fictitious but it is not transient. As home pages grow increasingly elaborate, their value to their creator grows. While it may not be terribly costly to discard, say, a name on AOL in order to escape from the consequences of actions done under it, one is far less inclined to abandon an online presence that has taken great effort to create. With an increasing number of articles signed with the writers Web page, the Usenet readers gain both a deeper context for understanding an author's view, and a greater commitment by participants in the virtual environment.

In conclusion

In this essay we have looked at how identity is established in the online world and examined how the role and importance of identity varies with the concerns of the community. We have seen that the importance of identity varies from absolutely essential to nearly without value. And we have seen that identity, already a complex concept in the embodied world, is further complicated in the online world by the diverse relationships existing between the real, embodied self and the virtual persona. Our goal has been neither to champion authenticated real-world identities nor to recommend a free-floating world of evanescent personas, but to provide a framework for understanding identity in the ever-evolving virtual world.

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