

**Consumer Protection in the
Decentralized Network: A Mapping of
the Research and Policy Terrain**

by Rohan Samarjiva

Do not quote without permission of the author.

c. 1994. Columbia Institute for Tele-Information

Columbia Institute for Tele-Information
Graduate School of Business
809 Uris Hall
New York, New York 10027
(212) 854 4222

I. INTRODUCTION

The problem addressed in this paper begins from the phenomenon of "use privatization," described by Eli Noam (Noam, 1991), more particularly his concern that private networks will exercise power over persons connecting to the public network through them (pp. 15-16). Noam defines private networks rather broadly--"they are private in the sense of being separate from the public or general network, and they are not open to all in the way that the public network is" (1991, p. 2). This definition is not hardware or ownership based. It is based on access. Indeed, it suggests that membership in the private network is dependent on membership in some social group or organization, and that access to the network is based on access to the group or organization. When thought of in this way, the phenomenon loses some of its novelty. Organizations such as offices and hospitals that are used as illustrations have had "membership" criteria and also telecommunication systems governed by internal sets of organizational rules for quite some time. At the simplest level, the household (which is the unit that is usually considered the "consumer", in relation to the residential segment of the public wireline network) is an organization with its own rules about access to the telephone instrument and whatever network it provides access to. A pay phone with its technologically embedded rules about network access also affects what a user may do or may not do. So, the phenomenon is actually more general, and more important, than Noam appears to suggest. But the phenomenon has undergone dramatic changes since the liberalization of customer interconnection to the public network in *Carterfone* (13 FCC 2d 420 (1968), recon. denied, 14 FCC 2d 571 (1968)), and the proliferation of private networks is obviously of major significance.

Figure 1 About Here

The principal modes of consumer access to the network or network of networks¹ are depicted in Figure 1. Of all the ways in which a consumer can access the public network, there is only one in which he/she can directly access it. Even here, it must be in the role of consumer as sole occupant of a household, where the intermediate layer of the household social organization does not exist. In all other situations, the consumer must go through some form of an intervening layer. In a household, it is the family or other social relationship. In the case of access through a pay phone, the pay phone provider can constrain or enable the consumer's form of access. In cases where the consumer is connected to the public network via a private network, the provider of the private network can constrain or enable consumer access. This is in addition to the household layer, if it exists.

The above discussion dealt with the consumer as only as a "calling party". But almost every consumer is also a "called party". Access to the network is sought not only for the purpose of initiating outgoing calls (faxes, computer messages, etc.)²; the ability to receive incoming calls (etc.) is equally important. Control of the interfaces between the various networks, the networks and the physical spaces abutting the network, and the design of the networks and the physical environments can be used to constrain and enable the making of incoming calls as well as the receipt of outgoing calls. A private network can be programmed to reject all calls from a specified prefix. In jurisdictions where the call reject service of the "call management services" package has been offered, a residential telephone system (most North American homes have more than one

1 This lengthy formulation is hereafter abbreviated to network.

2 This broad meaning is included in all references to "calls" and "calling" and "being called" in this paper.

telephone) can be programmed to reject specified calls without the phone even ringing. Pay phones are frequently programmed to not accept incoming calls at all.

In this paper, I first develop a taxonomy of forms of consumer access to networks, describing the various types of relationships. Second, I outline a theoretical framework for analyzing the policy implications of the phenomenon under consideration. Finally, I discuss the consumer protection implications of access to the network in terms of research and policy.

II. A TAXONOMY OF FORMS OF CONSUMER ACCESS TO NETWORK

At the simplest level, entities participating in the network may be classified into two groups--individuals and organizations. Organizations do not actually make calls, individuals call on their behalf, even in this age of automatic dialling and announcement devices and computer-to-computer communication. Thus the classification actually means individuals *qua* individuals and individuals *qua* organizations. But for convenience, the abbreviations of individual and organization will be used. Given the paper's focus on consumers, the taxonomy will exclude organizations. Individual participants in the network are described as consumers, irrespective of whether or not they have contractual relationships with network providers. That is, a homeless person using a pay phone would be included in the category of consumer.

Figure 2 About Here

Figure 2 shows the primary modes by which consumers can be connected to the network. Consumers can be connected through the ubiquitous, predominantly wireline, public network. They can also be connected through non-ubiquitous (but this condition is not

necessarily permanent), predominantly wireless, public networks, exemplified by cellular networks. The basic distinction between the wireline public network and the wireless public network is that the former was set up as a network connecting immobile physical locations (e.g., rooms in buildings) and that the latter was set up as a network connecting mobile physical locations (e.g., cars). If the inchoate moves toward personal telephone numbers on the part of wireline network providers and those toward portable cellular telephones and personal communication devices on the part of wireless network providers succeed, this distinction may begin to blur. Even if the two types of networks were to converge in terms of functionalities and ubiquity, their different institutional histories would still justify separate treatment.

Consumers may directly connect to the wireline or wireless public networks as sole users, or they may connect as household units. In the former case, there is no intervening social organization between the consumer and the network. In the latter case, the rules of the household enable or constrain the consumer's access to the network. An individual consumer's interests regarding network access may come into conflict with those of other individuals in the household or with the household's rules. It has been customary to conflate household and consumer (perhaps because the people writing on the subject did not occupy subordinate positions within households), but two recent policy controversies have highlighted the need to open the "black box" of the household.

The first controversy was regarding parental liability for portions of the telephone bill reflecting audiotex usage by minors (Samarajiva & Mukherjee, 1991). Here, the affected parents claimed that they were not liable for the high audiotex charges because they did not make the calls and/or the network provider's services had changed in a way that made it difficult or impossible for the parent to regulate network access by members of the household. These claims were taken seriously by regulators, legislators, and

even by the LECs. The disconnection of the complainants from the network, at least as far as local exchange voice telephone service was concerned, was generally prohibited and various methods of blocking access to audiotex services were devised and offered to parents. In many cases, the LECs forgave the payment due, especially if the appeal was regarding the first audiotex bill.

The second policy controversy was regarding "call management services". At a very basic level, Caller ID, the most controversial of these services, challenges the conflation of household and consumer. Contrary to the promise of its name, Caller ID does not identify the caller, it merely transmits the telephone number assigned to the household or the location from which the call is being made. Should the called party wish to actually identify the caller by name, he or she must utilize a reverse directory or an equivalent database. But what most of these directories and databases provide is the name of the subscriber, not necessarily the name of the caller. This is also the case with calling name delivery service, which delivers number as well as name.

The assumption that the "will" of the household is identical to that of its members was challenged most poignantly by women's groups who intervened in "call management service" proceedings (e.g., Manitoba Association of Women's Shelters, Inc., 1991; Grieger, 1991; see also Samarajiva & Shields, 1992a). Instances of the abusive spouse disconnecting the telephone instrument from the wall jack and taking it to work (affecting the abused spouse's ability to make and receive calls) were reported and the potential uses of the calling number display device and the call return service to monitor calls to the abused spouse were pointed out. Policy analysis premised on the conflation of household and consumer was incapable of addressing situations of coercive and abusive relations within the household (Samarajiva, 1991a). Shared access to wireless public networks through cellular and PCN devices has many similarities with household access

to the wireline public network. Current pricing policies that charge for incoming calls as well as outgoing calls further complicate the sharing of access to the wireless public network.

Even though pay telephones are considered by many to be part of the wireline public network, this taxonomy locates pay telephones in a different category. A pay telephone provides direct connection to the wireline public network like a telephone set in a household. However, its user's options with regard to interexchange carriers (and perhaps other features in the future) are affected by someone else, the owner of the physical location of the pay telephone facility or some entity drawing its authority from the owner. The recent decisions of certain pay telephone operators and city governments to remove incoming call reception and touchtone capabilities in the name of the drug war illustrate the point.

The fourth mode of connecting to the network is through private networks interconnected to the public networks. Consumers can connect to private networks in four capacities-- as residents, as voluntary "inmates" of institutions, as involuntary inmates of institutions, as employees *qua* consumers. First, they may find themselves having to connect through a private network because they are residents in more or less permanent housing that has some form of common administration. Generally, they will tend to be renters of one form or another, though this category could include some forms of condominium ownership as well. Students living in dormitories or university-owned townhouses are a good example. The form of accessing the network is specified in the rental or condominium agreement.

In the same way that the central administration of these types of housing imposes rules of behavior in physical space (e.g., no pets, no loud noise after a certain hour), rules of

behavior in electronic space (discussed below) can be formally written into contracts or incorporated into its technical design (Péladeau, 1991). The consumer is faced with the choice of accepting the housing contract *in toto*, or finding other accommodation. The consumer's ability to make this choice or to negotiate the deletion of certain clauses of the contract (though this is extremely difficult if the undesirable rules have been embodied in the technical design), is dependent on factors other than telecommunication, namely the market in housing and the consumer's relative valuations of various elements of the housing package. Even this option may not be available to the consumer if the housing is a precondition of something else such as enrollment in a university or employment in a factory. In these situations, the exit option affects the consumer's education or employment, not merely his or her housing. Consumer options can be further constricted in situations where the rules of the private network are changed, by amendment of the lease or by changes in technical design, after the consumer has taken up residence. Here, the difficulties of moving or of getting out of the lease commitment, constrain the exit option. Family units or room-mate arrangements give rise to an additional layer of constraint/enablement.

Second, consumers may find themselves having to connect to private networks in their capacities as voluntary "inmates" of institutions, generally short-term. Examples are consumers in hospitals, resorts, camps, and hotels. Where the stay is long it may be more appropriate to consider the issues under the closely related sub-category of residents, discussed above. As in the case of residents, the voluntary "inmates" have greater or lesser exit options. Consumer sovereignty vis-à-vis telecommunication options has little relevance to a person being admitted to hospital following cardiac arrest. As in the previous sub-category, factors external to telecommunication such as the supply and demand of hotel rooms, and relative valuations placed by consumers on elements of the bundled product offered by the institution affect the consumer's ability to

exercise choice. Here too, "the household" may affect the terms and conditions of access by a consumer. Examples are a family sharing a hotel room and two patients sharing a hospital room and a phone.

The third sub-category of connections to private networks are those available to involuntary "inmates" of institutions. A prisoner in a jail, a suspect in a remand cell, and a juvenile offender in a place of corrections are examples. Depending on the circumstances, armed forces personnel may belong to this sub-category or to that of resident. A soldier in "boot camp" may be considered an involuntary "inmate", while a soldier living with his family in armed forces housing may be considered a resident. By definition, consumers falling into this sub-category have no exit options. Therefore they only have the option of voice if the terms of access to the network are undesirable (Hirschman 1970). Not having the exit option weakens their voice. In addition, institutions of incarceration are pervaded by coercive power relations which affect access to the network and negotiation over that access as well. Yet it must be emphasized that power, even of prison administrators, is not absolute, and that inmates can and do exert agency (Samarajiva & Shields, 1992a, p. 408).

The final sub-category is that of employee *qua* consumer. Here, the employee is seeking to access the network in "company time" and using the organization's equipment, but for purposes different from those of the organization. Making a call from the office to a childcare center during office hours is an example. What the employee does outside "company time" falls into previously described categories, since those activities are of a consumer and outside the purview of the organization. What the employee does *qua* employee, is outside the purview of this paper.

In actual fact, the line between employee *qua* employee and employee *qua* consumer is not bright and clear. To take the example of the call to the childcare center, what is the status of the call if the childcare center is a facility provided by the organization? What if the employee is working overtime (uncompensated), and calls the baby-sitter using the organization's equipment? What if the employee is on the road on the organization's business and routes a call home via the organization's network? Does it make a difference if that call was made during working hours, or when the employee was stranded in an airport due to bad weather? Many of these questions have been resolved, leaving little if any leeway for the employee, in blue-collar work settings. But the practices of white-collar work places have been a lot more relaxed. Current perturbations in this area appear to be the result of efforts to increase productivity in white-collar work places using information and communication technologies.

Some aspects of these delineation problems are likely to appear under the categories of consumers connecting to public networks (wireline and wireless) when their equipment and/or service charges are picked up by the organization because they work at home or on the road for the organization. This "spillover" is likely to increase with the blurring of the lines between work and leisure and between work place and home, driven in part by teleworking and personal communication technologies.

III THEORETICAL FRAMEWORK³

The theoretical framework used in this paper is a communication-based reworking of Giddens' structuration theory (1981, 1984, 1985), with emphasis on time-space and the role of recursive practices in reproducing structure. Drawing from the burgeoning

³ Extracted from Samarajiva & Shields (1992b).

multi-disciplinary inquiry (e.g., Benedikt 1992) crystallizing around the concept of "cyberspace" (Gibson, 1984, 1987, 1988) and our own research, we have sought to rejuvenate Giddens' rather listless notion of locale. We have chosen to center our work around the notion of "electronic space", reserving the Gibsonian sense of cyberspace--involving direct mind-network-mind communication--for applications more exciting than talking on the phone. Perhaps the most important idea taken from the cyberspace literature is the conceptualization of the network as a space, rather than as a conduit, or as a system of conduits. We introduce a cluster of related socio-spatial concepts--"micro space", "macro space," "environment," "public space," "private space," and "electronic space". The framework is presented in greater detail in Samarajiva & Shields (1992b).

Space can be understood as a terrain of human interaction. Space is produced, reproduced, and transformed by the same structural forces, social relations, and conflicts which affect social life more generally (Lefebvre, 1974/1991). Space thus produced serves as a context or resource for action: "social space is what permits fresh action to occur, while suggesting others and prohibiting yet others" (Lefebvre, 1974/1991, p. 73; also Giddens, 1979, pp. 202-206). In other words, as a social product, space is a material force which reflects back upon social processes. This is the essence of what Soja (1980; 1989, pp. 76-93) calls the "socio-spatial dialectic".

Physical space can be distinguished from what Giddens describes as the "created environment" (e.g., pastures, national parks, offices, street corners, shopping malls) defined as "a manufactured series of settings, in which even the countryside is largely ordered in terms of social influences, rather than being a 'given' world of nature" (Giddens 1989, p. 280). Humans draw upon and/or are constrained by aspects of the physical environment in the production of space. These abstract qualities of physical

space and physical environment also hold true for electronic space and electronic environment.

The simplest form of physical micro space is constituted by the co-presence of human actors knowledgeable of each other's existence and relating in some way to each other. Aspects of an environment (e.g., the existence of walls, high noise levels) play an important role in the constitution of a physical micro space. The crucial aspect of the environment is its potential communicability (e.g., Is vision obstructed? Does sound carry? Do actors perceive the environment as conducive for interaction?). The design of physical environments provides a powerful vehicle for the exercise of power over actors--exemplified by the design of contemporary shopping malls which channels and directs consumer behavior. The specific relations (or lack thereof) between human actors in the environment affect the nature of the physical micro spaces that can be created within the physical environment. These relations are shaped, in turn, by factors such as the comparative location of the interactants in social structure, the perceptions interactants have of these locations, the interactants' perceptions of their previous history with each other as well as their expectations concerning future relations. Depending on the nature of relations between co-present actors in a given environment, multiple physical micro spaces can be created in one physical environment. The existence of other spaces in the environment affects the constitution of a physical micro space as well, in the sense that one space is part of the environment of another. A prisoner who occupies a physical micro space with his/her guard is constrained in the ability to create a new micro space with a third party, for example.

It is possible to conceptualize spaces where actors are not in each other's co-presence but act as though they were. We describe these as macro spaces. The nation state and corporation are examples. Thus the nation state is a physical macro space because not

all the human actors are in each other's co-presence but behave, for certain purposes, as though they were a collectivity, as though they were connected by some relationships. Nation states, described as imagined communities (Anderson, 1983; Schlesinger, 1991, pp. 152-175), are constituted by the existence of two minimum conditions. One is a transportation-communication network that enables state institutions to mobilize their coercive forces (Giddens, 1985, p. 224; Innis, 1950/1972). The other is the ability to maintain a common mindset among the constituent actors. At the present time, this mindset, an internalized macro space, is sustained primarily by distance-spanning communication media. Other macro spaces such as corporations and religious orders have equivalent methods of exercising coercion and maintaining a common mindset.

It is important to recognize that physical macro space is constituted from physical micro spaces. In the final analysis, the actions that sustain or transform physical macro space will occur in micro space. For example, coercion, even if exercised in the name of the imagined community, will be actually exercised in a situation of co-presence. Until the advent of electronic media, all significant social interactions occurred in physical micro spaces. Even with electronic media, significant social interactions will continue to occur in electronic micro spaces, in addition to physical micro spaces.

With the development of advanced communication media capable of transmitting large volumes of data more or less simultaneously, we begin to see the creation of electronic macro spaces. The theoretical network firm is a good example. Actual firms, however networked, are amalgams of electronic and physical macro spaces. This is not to rule out the possibility of a true network firm. Indeed, it appears that the balance is shifting toward firms as electronic macro spaces, and away from firms as physical macro spaces (e.g., Antonelli, 1988). Whereas the physical micro spaces within a physical macro space are actually adjacent to each other, the physical spaces within an electronic macro

space are not. Yet, the constituent human actors in the macro space will behave as though they are part of a collectivity.

At the present time, we are beginning to see the emergence of electronic micro spaces, and new forms of physical and electronic macro spaces. In electronic micro spaces, the actors achieve conditions approaching co-presence via electronic communication media. Generally, these micro electronic spaces tend to be located within an electronic macro space, but it is possible for a physical macro space to be made up of electronic micro spaces. An example would be a nation state made up of communities constituted by geographically separated but electronically linked subjects, instead of geographical communities as at present. However, electronic space can never completely supplant physical space. Certain social relations such as procreation and exercise of coercive force can occur only in physical space (though proponents of cyberspace will argue otherwise (Benedikt, 1992; Gibson, 1984, 1988)).

Electronic spaces must be constituted within electronic environments. In general, the possibilities of constraining and enabling space constitutive activities are greater in electronic environments than in physical environments. Indeed, it is impossible to study interactions within electronic spaces independent of the electronic environment. Characteristics of producing and reproducing physical and electronic environments span a wide range. In some cases, the upfront costs of producing the environment (i.e., building the plaza, establishing the network) are relatively high and the costs of reproducing it (or more conventionally, of maintaining it) are negligible. In such situations, there is a tendency to treat access to the environment as a public good (i.e., not charge for it, or bundle the costs with a related private good). In other cases, where the costs of reproducing the environment are relatively high, the tendency is to treat access to the environment as a private good (charge on the basis of usage). The latter type of

pricing tends to reinforce the ability to control space constituting activities within the environment. The ability to regulate access to features of the environment through price as well as "technical" design features allows for a more dynamic and continuous exercise of control than is possible only with design.

A subject is not limited to one macro space and one micro space at any given time. One person may belong to multiple macro spaces simultaneously. Within one physical macro space, there can exist multiple other macro spaces, like a set of Russian dolls enclosed one inside another. A person may simultaneously belong to a nation state, a region or province of that state, an ethnic community, a municipality, a neighborhood, and so on. One may similarly belong to multiple electronic macro spaces, though the relative positioning of the electronic macro spaces is much more flexible, enabling as it were, a cutting across of the set of Russian dolls. Transnational electronic spaces such as those produced by financial institutions puncture the boundaries of many nation states with relative ease, for example.

In contrast to macro spaces, the multiple micro spaces that a person may belong to will not usually be enclosed one within another. Given the relatively higher level of interactivity and involvement required in micro spaces, the number that a person belongs to at one time will not be very high. With the emergence of electronic macro and micro spaces, the number of spaces that a person can belong to at any given time has increased. Again, the increase is higher at the macro level than at the micro level.

With the requirement of face-to-face or similar interactivity, physical micro spaces tend to span short physical distances and time periods. The span of electronic micro space over both physical distance and time is much greater. Actually, the distances spanned by electronic micro space are of a different kind--not physical distance, but

"electronic" distances defined by bit rates, asynchronous vs. synchronous communication protocols, the presence of conversion protocols, and so on. Electronic environments manipulate time to a much greater extent than physical environments. The simplest form is in the store and forward capabilities found in electronic mail and telephone answering machines. It is likely that conventional time will be further pulled and contorted as electronic environments develop.

Micro space, physical and electronic, can be delineated as public and private. Erving Goffman (1963, p. 9), a preeminent theorist of face-to-face interactions, defined public spaces⁴ as "any regions of a community freely accessible to members of that community." A precise definition of public space would require us to begin from physical public environments. Public environments are those not marked out as private by permanent or temporary markers. Highways, sidewalks, plazas, public parks, etc. would clearly fall within this category. Public as well as private spaces can be created from public environments. The range of possible spaces extend from the strongly private (e.g., lovers on a park bench) to the strongly public (e.g., police officer directing traffic), with most of the possible spaces occupying various points in the middle of the continuum.

The definitions of electronic private and public spaces are similar to those of physical private and public spaces, except for the fact that they are constituted from electronic environments. One of the simplest forms of electronic public space can be found in the CB Simulator on CompuServe. A CompuServe_user signing on to the CB Simulator would usually choose a pseudonym and get into a free-flowing "conversation" (using text) on one theme or another with whoever happened to be signed on at that time. Public wire-

⁴ Hereafter, micro space is abbreviated to space.

line and wireless networks constitute electronic public spaces. These networks offer the possibility of initiating dyadic or group communication links with millions of individuals, and of having one or more of these millions of individuals initiate communication with oneself. In terms of potential, the moment of "entering" electronic space by lifting the handset is similar to entering a physical public space where one could initiate contact with any one of the multitude inhabiting that space, or having any one of those individuals initiate contact. In the case of electronic space, the possibility is that of initiating contact with a person or persons in that space at that moment (e.g., in the case of chatlines), or of initiating contact with those in physical private and public environments abutting the electronic space (i.e., a telephone consumer at home or in a pub with a telephone, a physical public space). In practice, we do not establish contact with totally unknown persons in electronic space nor in physical space in most instances. Such contacts are initiated infrequently in electronic as well as in physical space, but the predominant pattern is for individuals to navigate their way through public space to establish contact with a known person or persons, at which point the dyad or larger group effects a complete or partial withdrawal from the public space into a private space. In both physical and electronic public spaces, the possibility of unintentional collision exists, bumping into a bystander in the former and dialling a wrong number in the latter. In both physical and electronic public spaces, the boundaries of these private spaces are defined by negotiation primarily between the communicating parties.

The proposition that public networks are electronic public spaces is challenged most by the apparent lack of co-presence between the inhabitants of the electronic public space. Many would find it difficult to accept the claim that the millions of potential called parties are co-present on the network at any given moment. They may be out boating, at lunch, or dead, for that matter. The frequency of busy signals and unanswered phones will be adduced to refute the claim of co-presence. However, space is also constituted

when one party believes the other is potentially co-present. Discovery that the other is absent terminates the space. In a public space, the expectation is not that a particular person will be there, but that the potential for communication with that person exists.

This relationship-based definition of space allows the extension and adaptation of social science research on familiar physical spaces to unfamiliar electronic spaces without reliance on analogic reasoning as was the case in our previous writings (Samarajiva, 1991b; Samarajiva & Shields, 1992a). If it is conceded that relationships can be established and/or sustained over electronic media, our formulation of electronic space can be accepted. If electronic space is accepted it is possible to treat humans as existing in physical and electronic space and to conduct research about interactions in both kinds of spaces, about how power in one kind of space is leveraged into the other, about how control over environment is translated into power in the resultant space, and how recursive practices of agents in these spaces produce and reproduce them. It is also possible to utilize the framework for policy formulation. The conceptualization of telecommunication network platforms as environments and social relations utilizing those platforms as spaces can allow telecommunication issues to be reconceptualized as equivalent to physical space issues, enabling the adaptation and adoption of purely value-based policy solutions developed for those familiar spaces.

IV. CONSUMER PROTECTION

This section assumes that all concerns relating to direct access by the consumer to the public network have been satisfactorily addressed. This is far from true. First, the consumer protection regime that now exists in public networks is quite undeveloped. Second, the moves and countermoves of providers of public networks in response to private network operators, customer-premises equipment (CPE) vendors, and users,

will destabilize even the imperfect consumer protection that exists. However, for the purpose of simplifying the analysis, consumer protection afforded to sole occupants households directly connected to the public network is held constant and used as a yardstick against which the various other modes of consumer access can be measured. A complete analysis will have to relax this assumption and analyze the system as a dynamic whole.

The household (or the family) is likely to continue to be a significant factor affecting consumer access to the public network for some time, despite industry initiatives in the areas of personal telecommunication numbers and devices tending to reduce the importance of collective and stationary access points to the network. However, the dependence of minor children on their parents and the persistence of collective living arrangements due to economic and psychological benefits are likely to counter-balance tendencies toward non-shared network access.

Inasmuch as the family home in North America now has a concentration of telecommunication equipment unimaginable just a decade or two ago, it is reasonable to assume that more CPE will be hooked up to the network from the household and that the household will itself become more of a private network. In brief, the abstract similarity between households interconnecting with the public network, and private networks, will become a concrete similarity.

The implications of the household as a physical space intermediating consumer access to the network will be discussed in relation to a problem that has already reached the policy arena, that of parental control over children's access to network services and services provided over the network. As network access becomes more important to children, especially teenagers, parents will seek ways to control that access. The net-

work can be configured to assist parents (default blocking of the majority of network services) or to assist children (non-availability of blocking, or blocking on request, or for fees). Incentives of network providers may lead them in either direction: the former because teenagers will spend money and are future subscribers; the latter because parents are present subscribers and capable of exerting political pressure. The parents are likely to demand public policy intervention in various forms, as they have already done regarding audiotex and chatline access.

The problem may be conceptualized in terms of electronic and physical space. The household is a physical space, pervaded by power. The power of the parent is never absolute, but for the moment, let us assume that it is highly asymmetrical in favor of the parent. The teenager's location in the physical space of the household constrains or enables his/her abilities to constitute other physical spaces, i.e., hanging out at the mall with a group of friends. By methods including control of egress and ingress from the physical environment of the household (e.g., locking the door at a certain time), the parent can control the teenager's constitution of external spaces. In other words, the parent leverages control over the physical environment of the household (among other things) to control the teenager's space constitutive activities outside the parent dominated physical space of the family. Changes in network technologies (electronic environment) that enable the child to constitute electronic spaces outside the family tend to be dealt with in the same way. The parent's efforts to have the network designed in a way that would enable the leveraging of power over family and household environment to control the teenager's outside activities are no different from ensuring that the outside door of the house can be locked and the parent has the keys.

Once the problem is conceptualized in this way, it is possible to either conduct systematic investigation of the implications of changing network access on the household, and

thereby formulate policy, or directly frame policy based on values. Is the family a "castle" wherein the powers of the "lord"/parent are absolute, and unchallenged by government? This question has different answers in different cultures at different times. Whatever the answer is for physical space, policy could apply it to electronic space. But this application is not simple. For those who think it is, I pose a simple challenge. Substitute abusive husband for parent, and abused wife for child, in the above discussion. How can policy, including policy on network design, accommodate values that privilege the needs of parents to control their children and the equally legitimate values that privilege the needs of abused women?

The basic issue of leveraging control over physical environment and space, to control over electronic environment and space runs through many of the private-public interface issues raised by Noam (1991) and the additional issues (conceptually similar, but not as glitzy) raised in Section II of this paper such as problems pertaining to pay phone interfaces with the public wireline network. In the case of pay phones, the store owner or the airport operator controls the physical location of the facility. The value of this physical location as a pay phone interface depends on adjacency to a physical public space and the amount of pedestrian or vehicular traffic within it. A part of the property rights pertaining to such a physical location is contractually assigned to the pay phone operator in return for payment. The pay phone operator utilizes this exclusive right to build an interface to the public network from that particular location with whatever design features he/she thinks will maximize returns. In other words, the pay phone operator leverages power over physical environment to power over electronic environment. The consumer technically has an exit option, but in many cases there may be no other ways to access the public network from the proximity of that particular physical location. Within the electronic environment provided by the pay phone operator, the consumer

also can dial extra digits or whatever, and try to circumvent the technologically embedded rules imposed by the operator.

Again, conceptualization based on the framework presented in Section III can lead to research or to purely value-based policy formulation. Research can address consumer behavior at pay phones, the relative valuation of pay phone locations, etc. In the case of value-based policy formulation, the framework directs attention to how ingress and egress paths that bear bottleneck characteristics have been dealt with in physical space. There is really not much of a difference between the basic issue addressed in 1877 in *Munn v. Illinois* (94 US 113) and the problem of delimiting the latitude pay phone operators have to constrain/enable consumer behavior. The fact that most, if not, all pay phones are located in public environments in the sense used by Goffman (i.e., public not because of government or other forms of public property rights, but by reason of more or less open access), distinguishes the pay phone problem both from the above discussed problem of household access and the problems of access to the public network via private networks, discussed below. It must, however, be emphasized that the location of pay phones in public environments does not imply a claim that the electronic spaces constituted by their users are public as well. As discussed in Section III, private physical or electronic space can be constituted from public environments.

Of the four sub-categories of connections to private networks outlined in Section II, the resident and voluntary "inmate" categories can be dealt with together since the essential difference between them is the duration of stay. Here, the basic problem is that physical environment (e.g., dormitory, hotel room) is being bundled with a particular form of electronic environment. Control over physical environment is being extended to electronic environment through the process of bundling. Generally speaking, the extension of market power from one market to another through bundling is considered undesirable.

But whether this is being done or not in cases falling under these categories is an empirical question. It is possible that there is really no market power in the hotel industry in a particular region, even if one hotel bundles network access of a particularly undesirable form with the hotel room. One problem in undertaking this type of analysis at the present time is that network access constitutes such a miniscule portion of the bundled package. But with the increasing importance of network access, it is possible that it becomes more commensurate with the other elements of the bundle of services offered by a hotel or similar institution.

Another way of coming at the problem is to identify situations where the exit option is severely limited, e.g., where accepting dormitory accommodation is a pre-condition of studying at a particular university. Public policy could develop identify a threshold of involuntariness beyond which certain safeguards for consumers would kick in. Hospitals where patients cannot make exit decisions due to medical/insurance factors, university dormitories where residence is compulsory, company towns where residence is a condition of employment, etc. would thus be subject to a different standard than the one hotel in the airport strip that prevents a consumer from calling a 900 number. The publicness of the institution, either in terms of ownership or in terms of publicness of purpose, may also be factored into the policy equation.

Access to the network by involuntary inmates of institutions poses a somewhat easier problem. These consumers have always had their physical-space egress and ingress controlled. Extending that control to electronic space does not mark a radical change. The only problematic areas are where the levels of control in the two forms of space are dramatically different, or where the manner of control is inconsistent with contemporary standards for the treatment of incarcerated persons. As with the case of the household, the formulation of the problem as one involving two different forms of social

space enables research to be conducted or policy to be formulated based on value judgements. If the applicable values hold that solitary confinement for long periods of time is cruel and unusual punishment, it is not unreasonable to infer that complete prohibition of access to the network also constitutes cruel and unusual punishment.

Conceptualizing incarceration as the coercive restriction of a person's ability to constitute physical and electronic spaces, leads to an interesting idea for releasing the pressure on prison space. Why not punish certain kinds of crimes by restricting the ability to constitute electronic spaces only? The Secret Service and other law enforcement agents pursuing "hacker" and "crackers" appear to have hit upon this idea before anybody else, evidenced by their proclivity to "confiscate" all network interface equipment in the suspects' households. There is also the apocryphal story about Kevin Mitnik (one of earliest "phreakers" to be apprehended) being served with an injunction not go near a telephone. I have suggested on an earlier occasion (Samarajiva, 1991c) that obscene and harassing callers should be punished by having network privileges withdrawn or curtailed. I recognize that problems of enforcement and civil liberties must be carefully examined. Yet, the idea of meting out electronic punishment (and prevention of recidivism) for electronic crimes appears to have intrinsic merit.

The employee sub-category is quite complex. In legalistic terms, it can be argued that an employee cannot be a consumer on "company time" and using the employer's equipment. Indeed, most concerns about the attrition of employees' rights in relation to network access appear to refer to white-collar employees. Blue-collar employees have never enjoyed rights or privileges to engage in consumer activities on "company time" using company facilities, with the exception of certain customary rights built up in specific plants over the years. White-collar employees who enjoyed more flexible work conditions, and who usually do not differentiate between "company time" and personal or

leisure time as clearly as blue-collar workers do, had built up a different set of rights and privileges with regard to telephone use, newspaper reading, and so on. The contemporary drive for increased productivity in the office has threatened some of these rights and privileges, including some relatively new practices such as playing computer games on office computers. So what is really at issue is not whether the formal legal rights of employees to free association and speech are being taken away by the new technologies. It is whether changes to customary practices within white-collar work places (and to a degree, within blue-collar work places) being implemented partly through technical design of information communication technologies (e.g., PABXs that monitor outgoing calls by number and duration, computers that count keystrokes), and partly through new work rules are justified. Again, the question ceases to be a purely telecommunication question, but instead becomes one of socially acceptable working conditions in a particular time and place.

The problem of access to the network by employees for consumer purposes is somewhat tractable in relation to standard work places where the distinctions between work time and leisure time, and between the employer's facilities and the employee's equipment are clearly demarcated. But more and more, these distinctions are becoming blurred in many employment situations. The truly difficult problems lie in these grey areas. Employees whose performance is measured by output and not by hours at work tend to work outside hours in work places and/or take work home. Telework situates employees inside their own homes with company computer and communication equipment. Employees on the move carry company communication equipment around with them on their persons or in their vehicles. The potential for dual uses of time and equipment is enormous. It is difficult to prevent dual use by making the demarcations between work-related space and personal space sharper. But the other solution of increasing the surveillance capabilities of the technologies runs counter to many contemporary social

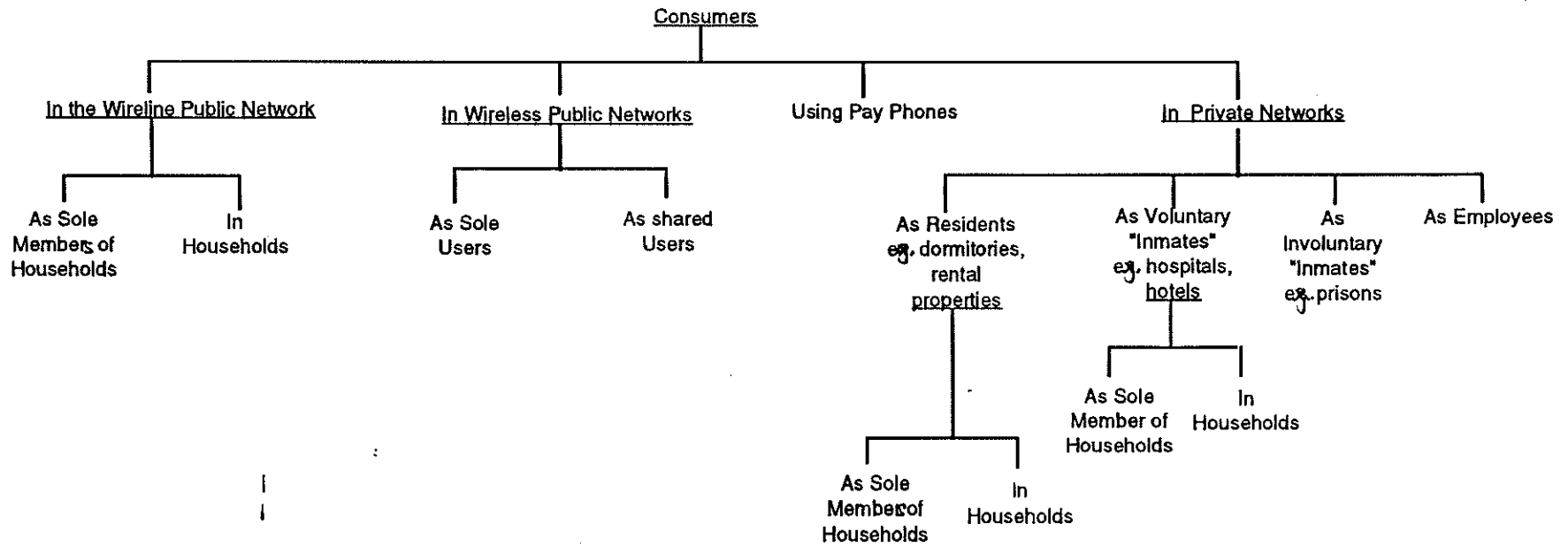


Figure 2: Forms of Consumer Access to Network