NORTHWESTERN UNIVERSITY

Rhetoric and the Wireless Revolution

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

For the degree

DOCTOR OF PHILOSOPHY

Field of Communication Studies

By

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EVANSTON, ILLINOIS

DECEMBER 2007

ABSTRACT

Rhetoric and the Wireless Revolution

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This dissertation concerns the rhetorical strategies and devices that define a wireless technology revolution in the United States. The inquiry engages in rhetorical criticism of key documents, texts and exigencies embedded within successive stages of the wireless revolution spanning twenty years. Three sites of discourse are analyzed: the wireless industry's vision and construction of its own revolution including the views of its insiders, the wireless revolution as constructed by feature writers for the public press, and the public advertising of wireless phones and services.

The resulting narratives reveal topics, lines of argument and "good reasons" for participation in the wireless revolution. Research is conducted following the grounded theory and rhetorical/critical perspective approaches. The method for discovering the primary topics is to randomly select and analyze extensive documentation from each of the three sites; from these materials eighteen texts are chosen as "representative

anecdotes” which carry the core of the arguments during each phase.

The dissertation concludes that the wireless communication revolution is not initiated by a single point of view, but by an entwining braid of multiple engaged resources within the three rhetorical sites. The revolution appears to be constituted, not constructed or determined, thus technology development and social change are mutually constitutive. The wireless revolution is propelled by a multitude of persuasive tactics within various rhetorical sites. There is not one discourse that propels the technology rather there are multiple strands. In the case of wireless technology, the strands of discourse are swept together at given moments in successive stages to create the revolution.

Acknowledgments

I owe a debt of gratitude to Professor G. Thomas Goodnight, chair of my dissertation committee. Some number of years ago, Tom asked me, “Who is your advisor?” One conversation led to another and then he was my chair. In the multi-year endeavor that followed I was the fortunate one. I have had the tremendous opportunity to work with a brilliant rhetorical theorist, an accomplished scholar and a gentleman.

To Professors James Ettema and Irving Rein, committee members, I extend my sincere appreciation for their support and guidance over many years, with Irv being my rhetoric and public culture inspiration since undergraduate days and Jim a mentor since the early 1990s in the MSC program. I would also like to thank Professors Paul Arntson, Kathleen Galvin and Michael Roloff for providing moral support along the path to completion. Professor Thomas Farrell was a committee member in the formative stage and I thank him posthumously. His presence is missed.

I am grateful to many industry leaders who shared wireless insights, gave up valuable time for personal interviews and contributed in other ways to the study: Terry Addington, LeRoy T. Carlson, LeRoy T. Carlson, Jr., James Dwyer, Tracy Ford, James J. Healy, Kevin Kelley, Michael Kalogris, Elizabeth F.

Maxfield, Robert W. Maher, Stephen L. Markendorff, H. Donald Nelson, Donald Porter, Richard H. Prentiss, Robert F. Roche, Herschel Shosteck, John Stanton, Dennis Strigl, John Sudmeier, Thomas E. Wheeler, Rhonda Wickham, and Kari-Pekka Wilsa. A special thank you goes to John Sudmeier, Tracy Ford and Pegeen Prichard, all of whom enabled my access to RCR's print issues for the early years of the wireless revolution, and to H. Donald (Don) Nelson, who provided ideas, information, and encouragement from beginning to end.

Thanks to some capable undergraduate students--Polina Sakalian (Lake Forest College), Ryan Inton (Lake Forest College), Matthew Miller (Northwestern University) and Moira Faehr (Northwestern University)—-my research load was lightened over the years. Finally, I would like to thank Pamela Richardson for her editing assistance and, of course, my husband and children, for all of their patience and support.

To Bryan, Matthew and Catherine

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Northwestern University

September 2007

Rhetoric and the Wireless Revolution

Chapter One

Introduction to Rhetoric and the Wireless Revolution

This study concerns the rhetorical strategies and devices that define a technology revolution in the U.S. marketplace. Specifically, it will examine the rapid spread of wireless phone technology in the United States in the form of a case study that crosses three time periods: inception, mid-term and stabilization of a communication revolution. Analysis will focus first on the wireless industry's vision and construction of a self-proclaimed "revolution" by internal industry communication then compare professional expectations to the "wireless revolution" constructed by feature writers for the public press and, finally, move to assess the public advertisements of wireless phone products and services created by the service providers. Conclusions will be drawn about the rhetorical

relationship between the public, industry and consumer advertising points of view.

Chapter One provides definitions for key terms, outlines the major theses, describes the method and organization of the project, and proposes its scope and potential value. The terms technology and revolution are explored in their various usages. The wireless revolution is defined within the broader context of technology and communication and established as a subset of the communications revolution. The concept of communication is examined and defined for the purpose of this study. In this chapter, I will first sketch the nature of inquiry that defines the study of technology; second, outline the communications revolution from the late nineteenth century to the present, the latter twenty-five years of which has witnessed the wireless revolutionary movement as a key subset; and finally, define the nature of this study as a rhetorical inquiry into the discourse of the wireless communication revolution by isolating the theory, theses, and procedures guiding inquiry.

Technology Revolution: The Case of the Cellular Telephone

From an early point in its market introduction, industry insiders proclaimed the mobile telephone a “revolution.” In

January 1984, three months after the inauguration of cellular service in Chicago, Donald Porter, director of marketing for Telephone and Data Systems, Inc. spoke to a group of independent (non-Bell System) telephone company managers: “A telephone revolution is taking place and it is called cellular telephone. … Tomorrow’s telephone company will be cellular. … The revolution is upon us” (22). On the inside cover of its 1991 State of the Cellular Industry report, the Cellular Telecommunications Industry Association (CTIA) states:

> America is too busy these days to tie itself to a phone line. Thanks to cellular, it doesn’t have to. … Cellular has freed [the American people] to lead a revolution in telephony. … Since its inauguration in October 1983, cellular has won public acceptance at historic growth rates. Faster than landline telephone. Faster than broadcast television. Faster than cable television. Faster than facsimile. (n.pg.)

Cellular pioneers could envision the beauty of the wireless telephone and what it might portend for the public, yet even the most optimistic analysts did not forecast the pace of change ahead. From the time of Porter’s speech, it would be only five years before one in four people in the United States used a mobile phone; ten years later it would be nearly one in two

("CTIA's Semi-Annual"). The mobile, or cellular, telephone would have a significant impact on the way people live and work, as did other technology revolutions in the second half of the twentieth century.

In The Control Revolution: Technological and Economic Origins of the Information Society, James R. Beniger lists dozens of "modern societal transformations" since 1950. Significant among them are the many technology revolutions: the computer revolution, the information revolution, the electronics revolution, the microelectronics revolution and the communications revolution (5-6). Since 1986, when his book was published, the Internet revolution and the wireless revolution also have come to pass.

What is a technology revolution? A. L. Shapiro discussed the nature of recent technology revolutions in the U.S., including the computer, Internet and wireless revolutions: "These are, no doubt, major developments. But in an age of unchecked hyperbole, it makes sense to ask: Are these changes really revolutionary? And if so, exactly what type of revolution are we experiencing?" (10).

It certainly is possible that the purveyors of technology are labeling revolutions as such to hype future sales of their products. But there is more to the story. Consider the present

state of technology in the United States. In the last three decades alone, the cell phone, personal computer and Internet have modified communication behaviors and reshaped social norms of communication. These technologies have individually and collectively transformed free time and leisure activities, in addition to having a major impact on markets and institutions. What, exactly, constitutes a technology revolution? Three wireless industry executives shared their views on the nature of the wireless technology revolution in the United States. According to Dennis Strigl, president of Verizon, Inc.:

> The wireless revolution is simply defined as wireless being used in place of wired technologies. … I think it is a convenient, easy way of using a telephone … [eventually] replacing landline [wired] telephone service. That's the revolution.

Another executive of a major wireless firm, H. Donald (Don) Nelson, President and CEO of United States Cellular Corporation, 1983-2000, described the revolution this way:

> I guess I've been part of the revolution or is it an evolution? It's a very fast evolution. When we started the business we thought that we could get [market] penetration of one maybe two percent. … [Then] we found out that it was an evolutionary process that

> really changed every year. As the size of the product got smaller, as the service areas got larger, as the two carriers got online and we had duopoly competition, it became much more of a business case of revolution. From a time point of view, [the revolution occurred] when we … introduced the “brick” [an early portable cell phone], which we thought was very revolutionary, but as we all know it was just the next step in the evolution of the product. … When we got to the [FCC] auction … there were people who were going to aggressively go after these properties. Because they were better than what other people thought and there was money to be made. Wall Street was excited about them. Telephone companies were getting very protective of everything that they had and what they wanted. This was the early post timeframe of the post AT&T breakup. So they [the telephone companies] were just trying to find their way. I think that was the first stage.

The wireless revolution incorporated earlier forms of communication technology, most obviously the wired telephone, which itself revolutionized communication in the late 1800s. Thus, wireless is part of a broader “communications revolution.”

Kevin Kelley, senior vice president for Qualcomm and former chief of the Wireless Bureau at the Federal Communications Commission (FCC), presented it this way:

> It's a communications revolution; it’s the way people communicate. It represents change. … The car phone, the portable, the transportable, somewhere in that '85-'86-'87 there was phenomenal growth. … I don't think there was a revolution when a lot of people had phones in their car. That wasn't the real revolution; the real revolution was when people were walking around with them. I can take this phone anywhere I want. … When people started carrying phones around with them, the real revolution came.

A key concept for the wireless revolution, then, was personal mobility. According to Nelson and Kelley, the technology that changed personal communication forever was not the car phone, but the portable phone, which enabled communication anytime or anywhere, and initiated the practice of calling a person not a number. While each wireless executive’s perspective varied slightly, they agreed on one fundamental point: The wireless revolution enabled a totally new level of personal mobility in communication.

Key Terms and Definitions

The meaning of a technology revolution takes its shape from history and its various usages of the word revolution. The scope and pace of social change generated by technology revolutions such as the computer and the cell phone might be considered in the context of the changes generated by major political revolutions in our history. Beniger writes, “Revolution, a term borrowed from astronomy, first appeared in political discourse in seventeenth-century England, where it described the restoration of a previous form of government. Not until the French Revolution did the word acquire its currently popular and opposite meaning, that of abrupt and often violent change” (7).

In the twentieth century, another kind of revolution, the scientific revolution, was defined to represent a major shift in scientific thinking. Thomas S. Kuhn described scientific revolutions as “non-cumulative developmental episodes in which an older paradigm is replaced in whole or in part by an incompatible new one” (92). He justified the use of the word revolution by describing parallels between political revolutions and paradigm changes in science. “Like the choice between competing political institutions, that between competing

[scientific] paradigms proves to be a choice between incompatible modes of community life" (94).

In 1980, technology historian Edward Constant described a third kind of revolution. In his book, The Origins of the Turbojet Revolution, he defined technological revolution as that which occurs when the technical community adopts a new normal technology:

> Technological revolution is the professional commitment of either a newly emerging or redefined community to a new technological tradition.... Technological revolution has occurred when a new tradition or practice comprising a new normal technology is initiated. This concept of technological revolution conflicts with more conventional conceptions. Here, technological revolution is placed much earlier. The revolution occurs not when the new system is operational, not when it is universally accepted, not even when it first works, but when it is accepted by even a significant minority of the relevant community as the foundation for a new normal practice. (19-20)

In contrast to a technological revolution which, according to Constant, occurs in the relevant professional community, a

technology revolution represents a societal transformation. The technology revolution unfolds in the public sphere as the public is influenced or becomes persuaded to leave old habits and adopt new practices around the new technologies. The discussion as to which is better, old or new, becomes a “politics” of revolution.

The word revolution is thus commonly attached to and associated with new technologies that diffuse rapidly in the public sphere, with dramatic social and cultural implications. The term technology revolution is associated with the notion of political revolution because of the dramatic change affecting the public. It is also associated with Kuhn’s notion of scientific revolution and Constant’s definition of a technological revolution. The modern technology revolution represents not only a technological innovation but also a public paradigm shift of significant proportion.

Society’s conceptions of political, scientific and technological revolutions thus contribute to a frame of reference implied by the technology revolutions of the present period. Unlike scientific and technological revolutions defined by Kuhn and Constant, however, technology revolutions of the kind described by Beniger (e.g., communication, computer and Internet revolutions) make their greatest impact in the public sphere.

The term technology has its own range of definitions. Technology is pervasive in modern culture, but what is it, exactly? Thomas Hughes defines it in a narrow sense as simply the “technical component of technology” (141-156). Tom R. Burns and Thomas Dietz expand on this by defining technology as “a set of physical artifacts and the rules employed by social actors to use those artifacts” (208). Thus defined, technology is embedded in a larger socio-technical system, which includes cultural and institutional aspects (209).

Broader definitions of the word technology include cultural, institutional and organizational aspects, in addition to the technical aspects. Arnold Pacey calls the combination of technical, cultural and organizational aspects a technology-practice and defines it as “the application of scientific and other knowledge to practical tasks by ordered systems that involve people and organizations, living things and machines” (5-6. An even broader definition, suitable for this inquiry, is one that includes references to economics, politics and human behavior. In the Preface to Beyond Engineering: How Society Shapes Technology by Robert Pool, technology is defined as:

> … the application of science, engineering and industrial organization to create a human-built world […affecting] virtually every aspect of human behavior:

> private and public institutions, economic systems, communications networks, political structures, international affiliations, the organization of societies, and the condition of human lives. The effects are not just one way; just as technology changes society, so too do societal structures, attitudes, and mores affect technology. (ix)

The broader the changes, the more revolutionary the technology. But change depends on definitions argued back and forth along dimensions of use. The wireless technology revolution, it will be demonstrated, has all the dimensions discussed above, with some understood better than others. For purposes of this study, wireless communication is that which utilizes a cellular telephone and any or all of its present day features and attendant devices including access to and use of high speed data applications, wireless Internet and multi-media applications. According to Thomas Wheeler, president and CEO of the Cellular Telecommunications and Internet Association (CTIA), 1992-2004:

> The term wireless began to surface in the cellular industry around the time of the spectrum auctions in 1994. The PCS providers were positioning their product differently from cellular. … The term wireless was invented to straddle a civil war between PCS and

> cellular. It was the only term that allowed the bridging of cellular and PCS. Wireless became the term that everyone could agree on.

It seems that since the mid-1990s, when industry adopted the term, all communications that operate wirelessly have been described as wireless. The wireless telephone itself is a cellular telephone enabled initially by analog radio signals and more recently by digital. The term wireless thus began with cellular technology and still represents cellular, but its scope has widened. The ensuing chapters will tell the story.

The terms technology and revolution in their combined state comprise aspects of the aforementioned established definitions yet create a new kind of metaphor that implies the existence of a rapidly diffusing technology within the general public, essentially marking the new technology's actual (or projected) emergence from the domain of the professional to enter the more ubiquitous usage patterns of the public sphere. The technology revolution metaphor suggests that a certain technology or family of technologies is bringing about a rapid, public change.

Technology revolutions thus defined represent social, organizational and economic change, as well as technical change. The scope and pace of change, expected or real, generates controversy, as advocates of new technology push for its

assimilation in the public, while opponents remain skeptical of its value and appropriateness. The technology revolution, and its attendant topics and controversies as it diffuses within the public sphere, is the main concern of this project.

As the latest communication technology to engage the public, wireless has and will continue to affect economic, social, cultural, political and organizational structures in significant and complex ways. The academic community has recognized this significance and, in the last two decades, scholars studying the history and impact of technology have generated their own research field, called technology studies. Scholars in this field come from diverse backgrounds “seek[ing] to increase the understanding of technological development as a social process” (Dierkes, Hoffman 9).

Technology studies can be divided into three parts; innovation studies, history of technology, and sociology of technology (Bijker et al. 21). The research methods are diverse. Bijker and Law describe the diversity:

> There are internalist historical studies; there are economists who are concerned with technology as an exogenous variable; more productively, there are economists who wrestle with evolutionary models of technical change; there are sociologists who are

> concerned with the “social shaping” of technology; and there are social historians who follow the heterogeneous fate of system builders. (11)

The technology studies field, with its diverse methods and wide ranging topics, has produced important work on “social shaping” as well as diffusion and its effects. According to E. M. Rogers, technology innovation scholars study diffusion using many backgrounds and approaches, from anthropology to marketing management (42-43). Research produced on the diffusion of innovations has demonstrated four main elements: innovation, communication channels, time and the social system (10). Models resulting from these studies, while contributing to “our understanding of the conditions for economic success in technological innovation” are nevertheless criticized by some sociologists as asymmetric and overly simplistic (Pinch, Bijker 22).

Those who study the history of technology focus mainly on the development of the technology artifact itself. In addition to their historical depiction, however, these accounts may recognize the importance of non-technical factors in a technology’s development. In Technological History and Technical Problems, Hughes writes that modern technology has a tremendous amount of “momentum,” arising mainly from non-technical factors

(141-156). Momentum is evident in the scope and pace of information and communication technologies that have transformed modern publics, but how does this momentum arise? Expanding on Hughes's concept of momentum, Pool notes how momentum and historical circumstances together affect a technology's development:

> Like a snowball rolling down a snow-covered hill and growing in size as it goes, a new technology can be pushed in one direction or another by relatively minor factors--a personality conflict here, a lack of funds there--but once it picks up size and speed, it's much harder to divert from its course. … The momentum of ideas shapes technology as surely as does the momentum of historical circumstances, the momentum of technological infrastructure, or the momentum of scientific knowledge. (31, 54)

The momentum of ideas, topics and controversies can advance a technology or derail it. Accordingly, there is much to be learned about the influence of non-technical factors on a technology's success or failure. Contemporary scholars who concentrate their work in the sociology or technology have recognized the importance of non-technical influences on the spread and significance of technology. A relatively new program

in technology called constructivist studies of technology is based on a combination of historical and sociological perspectives. According to W. E. Bijker:

> A central adage of this research is that one should never take the meaning of a technical artifact or technological system as residing in the artifact of technology itself. Instead, one must show how technologies are shaped and acquire their meanings in the heterogeneity of social interactions. (6)

Constructivist studies have demonstrated the complex social aspects of technological development and in so doing have challenged the notion of technological determinism, which generally holds that “a technology’s intrinsic properties and functionalities determine or drive socio-cultural changes” (Leonardi, Jackson 617). The goal of this study is not to support or refute technological determinism or social constructivism; rather it is to discover the role of rhetorical discourse in the wireless revolution.

Wireless is the most recent communication technology innovation to significantly change the way humans communicate. In the more than two decades that the wireless phone has been available to the American public, it has become a robust symbol of technological progress. In this inquiry into the wireless

revolution, the focus is on one particular non-technical factor that can influence a technology's future path--rhetoric. Before beginning the story of the wireless revolution, it is useful to review earlier developments in communication technology.

The Communications Revolution

The modern communications revolution marks a period of time beginning in the late nineteenth century and continuing through the present. During this time, advancements in communication technology have erased social and geographic distance and enhanced personal mobility. A mix of factors has given rise to the modern-day state of communication: science, technology, innovation, regulation, competition and risk.

The last quarter of the nineteenth century was a particularly robust period of innovation in communication technology. As Carolyn Marvin describes it:

> Five proto-mass media of the 20th century were invented during this period: the telephone, phonograph, electric light, wireless [telegraphy] and cinema. … New electric media were sources of endless fascination and fear, and provided constant fodder for social experimentation. (3-4)

Even at this early stage of mass media's development, Marvin notes, "The more any medium triumphed over distance, time and embodied presence, the more exciting it was, and the more it seemed to tread the path of the future" (194). These early forms of electric media fostered desire for more, faster and better forms of mass communication as people adapted and adjusted to new freedoms and flows of information.

In the first half of the twentieth century, communication technology specifically was further extended to mass audiences as film, public radio and television were introduced to the American public (19-20). The computer revolution in the 1960s and 1970s was followed in rapid succession by cable and satellite television and, finally, cellular telephones.

We are now, in the early twenty-first century, witnessing a progressive convergence between various forms of mass media, telecommunications and computing, fueled largely by advances in micro-processing and digital technologies (Beniger 25). Hotch and Dysart write, "The communications language of the future will be digital, and modern telecommunications is increasingly a marriage of computer technology and telephone technology" (22). If communication technologies of the nineteenth and twentieth centuries triumphed over time and distance, communication technologies of the twenty-first century are poised to triumph

over place. Calling a person has triumphed over calling a place; the mobility of technology has caught up to the mobility of people.

Often, successive products within a technology revolution represent a continuing reinvention of a prior technology. In Permanence and Change: An Anatomy of Purpose, Kenneth Burke (1966) writes:

> Indeed, what could discovery be but rediscovery? A man makes a new invention. Yet it is simply the external embodiment of prior mental patterns. This invention produces a change in environment, as a result of which, new habits must be formed and old ones abandoned. (181)

Within the communications revolution, prior experience helps in shaping new communication technologies and in fueling the rapid pace of consumer acceptance. The wireless phone enjoyed a rapid acceptance in part because it worked like a wired telephone.

Each successive communication technology advance increases our ability to exchange messages and meaning across time and distance, whether social, cultural or geographic. The communications revolution is defined as much by how these new tools are used, as by the tools themselves. The revolution is about the type of information that is transferred, as well as

the manner and means by which it is transferred. Communication technologies involve physical infrastructures, artifacts, social structures and the communication itself.

Communication, as a term, has multiple uses and definitions. It can be defined in numerous ways to suit a variety of purposes. Frank E. X. Dance identified fifteen conceptual components in his definition of communication. Most relevant here is “Transfer/Transmission/Interchange”, a concept in which “… the connecting thread appears to be the idea of something’s being transferred from one thing, or person, to another. We use the word communication sometimes to refer to what is so transferred, sometimes to the means by which it is transferred, sometimes to the whole process” (Ayers qtd. in Dance 205-206). Wireless communication meets all of these criteria. It simultaneously shapes the nature of a message, enables the technical means of transfer, and transforms the process of communications.

From a technical point of view, then, wireless phones replace wired phones. From a social point of view, however, the increased personal mobility is dramatically changing how people act and think. Wireless is, in effect, transforming the entire human communication process.

Project Objective

The project's main objective is to gain insight on the rhetorical aspects of a communication revolution. The inquiry will identify the rhetorical topics and arguments that define the wireless revolution. Three discourse sites within the period 1983–2003 will be examined: the industry's vision and construction of its own revolution, the revolution constructed by feature writers for the public, and the public advertising of wireless phones and services. The industry point of view will be contrasted with the views represented by mainstream press and advertising. It is anticipated that this inquiry will contribute to rhetorical studies in communication technology and supplement the work of historians, sociologists and diffusion scholars in technology studies.

For the purpose of this inquiry, rhetoric will be defined as "engaged argument" over the quality, significance and spread of technology. This type of argument will focus on questions concerning regulation, markets, institutions and social change, based on alternative views of the revolution's qualities and potential for success. In "The Personal, Technical, and Public Spheres of Argument: A Speculative Inquiry into the Art of Public Deliberation," G. Thomas Goodnight writes:

> … Rhetoric is an art, a human enterprise engaging individual choice and common activity, and … deliberative rhetoric is a form of argumentation through which citizens test and create social knowledge in order to uncover, assess, and resolve shared problems. (214)

This study represents an inquiry into the ways in which engaged argument across multiple sites helps legitimize rapid social change.

Within the substance of such engaged argument, I am looking for topics within the revolution's discourse representing lines of argument that, over time, become the focal points of justification and debate. These lines of argument will evolve as thematic concerns that reflect the interests and orientations of the different audiences of the revolution. Within the lines of argument in each site I will identify what Karl R. Wallace considered "good reasons:"

> Good reasons are a number of statements, consistent with each other, offered in support of an <u>ought</u> proposition or of a value judgment. … If the rhetorician were to adopt the term <u>good reasons</u>, he would have a technical label that refers to all the materials of argument and explanation. (247-248)

The good reasons for the wireless revolution will change over time but there will be overlap between the sites and the phases. An investigation into good reasons will help uncover what the revolution means to people and how it came about.

The topics and good reasons within each site create a story of the wireless communication revolution that comprises written text, spoken words, physical artifacts and visual print materials. Walter Fisher, in “Narration as a Human Communication Paradigm: The Case of Public Moral Argument” argued:

> The logic of good reasons maintains that reasoning need not be bound to argumentative prose or expressed in clear-cut inferential or implicative structures: Reasoning may be discovered in all sorts of symbolic action non-discursive as well as discursive. (1)

The emergence of stories within the wireless revolution that vary in form and interpretation will illustrate Fisher’s point that narrations have “sequence and meaning for those who live, create, or interpret them. The narrative perspective … has relevance to real as well as fictive worlds, to stories of living and to stories of the imagination” (1-2). That “humans are essentially storytellers” and that “good reasons vary in form among communication situations, genres, and media” will be apparent in the diverse stories of industry stakeholders,

journalists and advertisers within the wireless revolution (7). How were people induced to imagine their own participation in the revolution? How were pleasures denoted, insecurities heightened and reluctances offset as people witnessed the emergence and ultimately the pervasive grip of wireless technology in daily life? The reasons within the distinct rhetorical sites of industry, public press, and consumer advertising constitute competing yet compelling stories. Experts and non-experts co-exist, each group forming its own basis for participation in the revolution, each contributing to the social perceptions and the reality of the wireless revolution.

Within the three sites and their stories, this inquiry will additionally seek to identify the traditional categories of persuasion that operate within rhetorical discourse: logos, ethos and pathos. According to Aristotle (1954), “the first kind [ethos] depends on the personal character of the speaker; the second [pathos] on putting the audience into a certain frame of mind; the third [logos] on the proof, or apparent proof, provided by the words of the speech itself” [1356a]. The use of Aristotle’s terms is not to represent a speaker-audience theory of the revolution, but to uncover how the discourse of the revolution takes place/changes over time and within each rhetorical site. How and where is the subject of technology risk

handled? Where does ethos and character play a persuasive role? How do emotions drive or threaten the revolution? The goal is to understand how, when and where logical, ethical and emotional modes of persuasion are used in the different stakeholder constructions of a communication revolution.

According to James Jasinski, scholars in recent years have begun to explore the cognitive or judgment-inducing power of discursive forms such as narrative, myth and metaphor (192). Combining an understanding of how the three modes of proofs operate within each rhetorical site along with an analysis of the narrative or storytelling features of the sites may yield important clues about how rhetoric functions to resolve or diminish controversy and create or produce value judgments about contemporary, public issues.

Theses

The central contentions of this study are twofold: first, that a communication technology revolution functions as a rhetorical construction, observed, articulated and experienced through persuasive appeals and inducements; second, that the strategies and devices observed in three sites of revolutionary discourse serve to stimulate and legitimize, or to thwart and

disrupt the scope and pace of social change and investment associated with a new technology.

The goal of the case study is to understand more specifically how the rhetorical construction of a communication technology revolution, in this case the wireless revolution, supports (or undermines) its diffusion into the public market. Several theses are proposed:

1. Communication revolutions have characteristics that entwine scientific, technological, market driven, political and social change.
2. A communication revolution is driven by topics, lines of argument and good reasons where the nature of what is acceptable in the use, spread and choice of technologies changes over time.
3. A communication revolution is marked by periods, or phases, with more or less distinctive topics that are articulated by different combinations of ethos, pathos and logos.
4. The rhetorical discourse of a technology revolution operates with strategies to propel the technology forward, despite known or unknown risks, using persuasive tactics to legitimize the scope and pace of social change.

This study examines the rhetorical arguments constituting the wireless revolution during the period from 1983 through 2003 to explore the theses. It is expected that the beginnings of the wireless revolution may be marked by novelty and utility, when people first learned to use a new communications tool. The revolution's middle period, in which the pace of customer growth and technology change intensifies, probably includes market competition, improvements in technology and concerns for public safety. The third period is likely to be characterized as having slower growth in terms of new users but will be marked by other distinctive changes. The study will explore the discourses of revolution to see whether expectations were fulfilled and promoted equally by the press, the industry and advertising; whereas all these sites gave impetus to the revolution to some degree of different measure.

Procedure for the Study

I will select and analyze three representative texts from each of three time periods, or phases, within each site; thus, a total of eighteen texts will be analyzed over a twenty-year time period of the wireless revolution. The texts are intended to be

representative of the primary topics discussed within the time periods represented by each of the three phases.

Research will be conducted following the grounded theory and rhetorical/critical perspective approaches. Grounded theory is a qualitative method that uses “a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon” (Strauss and Corbin 24). This approach is concerned with building theory rather than describing or simply reporting on events. The grounded approach is embedded in the invention process of the dissertation. Rather than presuppose a theory of how revolutions take place, I worked through the discourse of the revolution to see how it evolved. The dissertation reflects the outcomes of these encounters in interpreting the data through a rhetorical/critical reading of representative anecdotes. According to Anselm Strauss and Juliet Corbin, building theory requires the development of “theoretically-informed interpretations” of data.

> Building theory, by its very nature, implies interpreting data, for the data must be conceptualized and the concepts related to form a theoretical rendition of reality (a reality that cannot actually be known, but is always interpreted). The theoretical formulation that results not only can be used to

> explain that reality but provides a framework for action.” (22)

The resulting theory should be “faithful to and illuminate the area under study” with the goal that it “ultimately be related to others within their discipline in a cumulative fashion, and that the theory’s implications will have useful application” (24).

Pertaining to the rhetorical/critical perspective, the study aims to discover theoretical insights concerning the rhetorical construction of a communication technology revolution. It is desirable that this theory provide useful application. An actionable theory about the key events and arguments present in a technology revolution could help us understand how public discourse operates to embrace and legitimize, reject or delay acceptance of a new technology. The rhetorical/critical perspective emphasizes critical reading of key sources on topics that persist but vary in content and importance over time and episode. Critical reading selects representative texts to examine how readers were invited to understand the possibilities and limits of the new communication world. Criticism in rhetoric can take many forms. Jasinski discusses five crucial characteristics of criticism:

1. Criticism defines: "… any act of rhetorical criticism will define its object as rhetorical (or as manifesting a significant rhetorical dimension)" (126);
2. Criticism classifies by "explicitly evok[ing] generic categories … or placing an object within a discursive formation (Sloop, 1996)." (127);
3. Criticism analyzes, or "seeks to describe or disclose how an object is put together and how it works" (127);
4. Criticism interprets, decodes or translates (128);
5. Criticism evaluates. The standards of evaluation are much debated. (131-135)

All five characteristics may not be present in an act of rhetorical criticism, according to Jasinski, but they "provide an initial orientation to the nature of criticism" (126). The rhetorical reading of a communication revolution, in this case the wireless revolution, will seek to examine where and how rhetoric functioned to challenge and change normative, logical and emotional functions within the revolution, as well as how the standing of the technology itself developed over time in three phases. Norms underwrite the qualities of character represented by the use of the phone-—who and where the

communicators are; and why what they do is fulfilling, motivating and appropriate for who they are.

Data Sources

Data will come from two sources. The first are published articles inside two industry magazines, RCR Wireless News and Wireless Week. These are the primary industry trade publications for the wireless industry and the major sources available to executives, managers, technicians, lawmakers and investors. Second are published articles within three U.S. newspapers: the New York Times, a lead and standard for the nation, the Chicago Tribune and USA Today. These papers represent the mainstream feature press. I will be reading a large body of works from both sources covering a period of twenty years. Within each category of sources, I will read and examine at least thirty randomly selected articles per year within each discourse site, totaling more than one thousand articles over the study period. From this reading, I will choose representative anecdotes from each phase and discourse site. The method for selection of the representative anecdote is Kenneth Burke's (1969) "representative anecdote" (A Grammar of Motives 59). A representative anecdote essentially carries the core of the

arguments in circulation at a given moment in time. While in some sense the selection is grounded in the subjective judgment of an author, the value of the selection can be found in the specific case by virtue of the strength of the argument that the text invites insight into a moment in time. Arnold Madsen "boil[s] down" the criteria for selecting representative anecdotes to "… basically three: The anecdote must reflect human action and symbol use, and it must simultaneously possess both scope and reduction …" (44). At least eighteen anecdotes will be selected to represent a period of twenty years of discourse in the wireless revolution. The anecdotal approach provides this study with a "procedure for analysis of discourse shaped over time" where the anecdotes are selected to "further explicate the motivational framework that underlies a text" (Madsen 29, 31).

The rhetorical analysis conducted in the dissertation is primarily of discursive arguments that are put into play by the industry and representatives of the press. However, analysis also is extended to non-discursive visual argument. In addition to analyzing discourse, I will look at visual argument, especially in advertisements. Visual argument works with captions to invite certain effects related to the functional efficiency or reliability of the technology, its cultural desirability, or social standing. The study will examine visual

issues in creating a style of attraction attached to a new technology. J. Anthony Blair writes:

> To the extent that visual communication causes us to change our beliefs or attitudes, or to act, without engaging our choice buttons, it is assimilable neither to persuasion nor argument. Once the choice light flashes, persuasion is occurring. And once we have identified expressible reasons that are provided for pressing one button rather than the other, we are being persuaded by argument. (23)

Visual arguments cue how the new technology is to be seen, seen with and valued.

Primary research will include first-hand interviews with industry leaders as a way to gauge insider perceptions of the revolution. Interview subjects include executives from wireless operating companies (e.g., Verizon), manufacturers (e.g., Nokia), the industry association, an investment firm, and industry publishers. The main purpose of these interviews is to illustrate how the revolution's insiders and revolution-makers understand and interpret the key events, topics and arguments during this technology's twenty-year history.

The interviews, trade publications and press analyses will provide perspectives from the people who constructed the

revolution and the press who reported on it. Combining this information with the social and lifestyle changes depicted by public advertising will present a well-rounded view of the changes brought by this particular technology revolution. The combination of resources will show how the industry foresaw the revolution internally, how marketing represented the phones to shifting markets, and how the press covered the aspects of the revolution as part of the public interest. From this arsenal of material, a grounded, rhetorical/critical theory of a technology revolution's rhetorical construction will begin to emerge.

Chapter Organization

Chapter Two will describe the first phase of the wireless revolution in detail, identifying and analyzing comparatively the major topics and lines of argument within each of the three rhetorical sites: industry, public press and advertising. Chapters Three and Four will analyze the second and third phases of the revolution in a similar fashion. Chapter Five will summarize and interpret the analysis across all of the revolution's phases to test the findings against each thesis. The theses then will be reassembled into a grounded, rhetorical/critical theory that represents what has been learned

about the rhetorical construction of a communication technology revolution. The final chapter reflects on the findings for this revolution and the potential contribution to the ongoing theoretical work in new communication technologies particularly related to the cell phone.

Scope of the Study

This project is a case study in the topics and arguments within the wireless revolution. These topics will be examined in the industry and public press as the revolution unfolded during its twenty-year commercialization period. The examination will include insider interviews with the revolution-makers themselves. Consumer advertisements of the period will be compared and contrasted to the industry and public press points of view. There are certain limitations with this kind of project. Case study research, while useful for understanding complex social phenomenon, provides little basis for statistical generalization (Yin 14). In this study, our goal is “to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)” (Yin 21).

This study is limited in other ways. First, no effort will be made to identify or discuss all of the literature related to

technology, innovation and communication. Literature from these fields is selected and used to provide a context for considering the technical and sociological aspects of technology revolution. We assume that technology is socially shaped and follows a multi-directional process, yet we find the traditional linear concepts of innovation diffusion to be useful as well. No effort is made to analyze diffusion of the cellular telephone in the empirical sense.

Second, this project examines a history of technology. The historical accounts of the wireless industry should serve as background. A more nuanced, accurate and complete rendering of the technology's development subsequently will examine the wireless revolution from the point of market commercialization in 1983 to the present. This is not a story of how the technical aspects of the technology developed, although the network infrastructure and the phone itself are key components in the revolution; thus, alterations and advancements will be noted.

Finally, by its design, a grounded theory will represent a theory of reality that "cannot actually be known, but is always interpreted" (Strauss, Corbin 22). A criticism of this type of research, and of case study research in general, is that the researcher's biases may influence the interpretations and conclusions (Yin 21). In this project, the author is a former

wireless industry executive who worked at a carrier company for more than sixteen years of the twenty-year period under review. While this experience affords the author certain insights about and contacts within the industry, it is possible that researcher bias will influence the interpretations and conclusions herein. Every effort to reduce bias will be made by adhering to the methods set out by the grounded theory approach and through overall awareness of the potential problem.

Justification for the Study

Although technology and communication scholars have recognized the importance of communication channels, networks and the artifact itself in a technology's development, a comprehensive study of the rhetorical arguments present during a technology's market commercialization period has not been undertaken.

Many disciplines study cellular telephones and related wireless technologies, including the effects of technology and diffusion. Heather Horst and Daniel Miller study the anthropological effects of cell phones in low income areas of Jamaica:

> The increasing use of the mobile phone in countries such as Jamaica … represents a renewed opportunity for anthropologists to consider the overall impact of telephony as a form of communication.… One of the central questions guiding our research revolves around the question of whether the cell phone [as it is represented in Jamaica] represents a symptom or a solution to the digital divide; that is, does the cell phone reduce or exacerbate difference between the wealthy and the poor of this world? (2-3)

Adam Burgess studies cell phone culture using a social constructivist approach. His book, Cellular Phones, Public Fears and a Culture of Precaution, attempts to understand how a "culture of precaution" influences a country's reaction to the possible link between cell phones and cancer. James E. Katz and Mark A. Aakhus investigate how mobile communication changes our social lives and organizations and, more generally, the role that mobile communication technology plays in everyday life. Despite the volume of writing on cell phones, rhetoric's role in the rapid acceptance of this relatively new technology is not often mentioned. Through this inquiry, the rhetoric of the wireless revolution will be revealed when the revolution's discourse is analyzed from a variety of rhetorical sites.

Maurice Charland writes:

> … discourse (language-in-use) mediates meaning. Furthermore, and this is key, the artful deployment of language, through topics, arguments, tropes and figures, has real effects upon language itself, upon meaning and finally upon what humans do. (465)

The strategy of the dissertation is to disclose the overall structure of discourse that invited, imagined, propelled, retarded and consummated a new culture of communication—-one that is with us and continuing to expand. This study will illustrate how the revolution's rhetoric configures meaning, action and consequence through the naming of the revolution and the actions taken to sustain it.

Burns and Dietz argue that technology's "dialectical interplay with human action gives occasion for the restructuring and transformation of the rule systems making up institutional arrangements and the culture of society" (230). A rhetorical construction of the wireless revolution will illustrate how a restructuring of social norms or rules takes place within this dialectical interplay. The dialectic will take its shape from the controversies and arguments of the revolution, which in turn will form the distinct phases of the revolution. Building on existing knowledge in communication and technology studies, the

dissertation will attempt to theorize a role for rhetoric in the public acceptance of a new communications technology. While this is not a study in cause and effect, there is value in describing and evaluating the progression of topics, themes, arguments and controversies from a rhetorical perspective. A rhetorical theory should contribute to understanding technology both as a social process and a rhetorical process. According to Dierkes and Hoffman, “There is widespread agreement that insights from a range of research sites has to be merged before a more comprehensive picture of technological development as a social process can emerge” (13). This study should help us to understand the ways in which rhetoric works to propel technology in the consumer marketplace.

Chapter Two

Phase One, 1983-1989: Cellular Telephones Become a Reality

The technology for cellular telephones initially was developed by a company that had dominated U.S. telephony for nearly a century--AT&T. For two decades before the first U.S. cellular system launched in Chicago, Illinois, the cellular radio proposal developed by AT&T's Bell Laboratories gathered dust while the U.S. government contemplated its merits. Finally, in 1982 and 1983, the FCC awarded cellular operating licenses for the top thirty (in terms of population size) metropolitan markets in the county. This chapter opens with a background summary on the cellular telephone industry. The first phase of the revolution, from 1983 to 1989, is then analyzed with particular emphasis on three rhetorical discourse sites: industry trade press, public (mainstream) press and public advertisements. The discourses of each site form narratives of the cell phone's early years.

Cellular Telephone Industry Background

The technology behind the wireless phone is called cellular radio. Radio technology includes broadcast radio, television,

various forms of private-mobile radio systems, satellite communications and cellular. Radio technologies use airwaves to send and receive electrical signals. Cellular technology combines radio signals with telephone switching devices to provide wireless voice and data transmission (Meurling and Jeans 8). Radio airwaves are divided into frequency ranges and bands, which then are assigned to private and common carriers by the FCC.

AT&T operated the first commercial car phone service in 1946. It used one antenna serving six channels in a small geographic area. According to John Meurling and Richard Jeans, AT&T recognized the system’s limits but also its potential, prompting its Bell Laboratories quickly to develop an alternative called cellular radio (16-17). The cellular concept more efficiently used airwaves by dividing a service area into smaller cells.

In the 1960s, AT&T introduced a limited mobile telephone service based on the cellular concept (Meurling and Jeans 25). However, it wasn’t until the 1970s that the Federal Communications Commission (FCC) set aside spectrum for public cellular systems (Roche 37-40). The FCC further authorized the development of two trial systems in the U.S. In the early 1980s, as these systems prepared to go “on the air,” interest in the

cellular technology and the FCC's licensing plan began to grow. According to Robert F. Roche, the FCC accepted as many as 190 applications for the largest thirty U.S. markets and more than 100,000 applications for the remainder of the metropolitan markets (60-61). Regulatory proceedings continued for more than a decade, ultimately providing for as many as eight competitive licenses per market. The early regulatory debates and decisions, as well as the ambitious, risk-taking behavior of wireless entrepreneurs (see Corr, Murray), mark the first phase of the wireless revolution.

Phase one will be analyzed from three perspectives: the public (mainstream press), the industry and consumer advertising.

The Public (Mainstream) Press

The beginning of the wireless revolution might be considered the 1983 launch of the nation's first cellular telephone system in Chicago, Illinois. The mainstream press had the primary role of announcing the new system's launch and educating the public on a new technology called cellular telephones. On October 10, 1983, the Chicago Tribune announced that Ameritech Mobile Communications would activate the first

cellular telephone system in the country later that week. The new technology, described as “mobile telecommunications using cellular radiotelephone technology,” was expected to have higher use capacity and better voice quality than the traditional mobile car telephone.

In 1983, Ameritech, AT&T’s subsidiary covering Chicago’s landline telephone operations, divided the city into small geographic cells which “handed off” calls from one cell to another. On October 13, 1983, the first commercial cell phone call in the country was placed in Chicago and “the quality of the call placed to New York was as good as a call placed on a regular telephone” (“Cellular Mobile” 1). According to the article, the new Chicago system was expected to serve 5,000 customers by year end and an estimated 100,000 customers within three to five years. It would cost $3,000 to buy and install a phone, plus $2,000 per year for annual service costs.

On June 16, 1984, the FCC authorized the start of a second cellular mobile telephone service in the New York metropolitan area. Hours after FCC approval, NYNEX Mobile Communications Company launched its cellular system covering New York City. The New York Times said that “as many as 100,000 calls “would be accommodated “simultaneously” through the new network (“Mobile Phone System” 32). Despite the early excitement over cellular

capacity, however, not everyone was enthralled by the prospect of cellular telephone-wielding motorists.

Concerns about cell phones causing driver distraction and invading personal privacy began almost immediately. On August 11, 1985, Chicago Tribune "Voice of the People" columnist Paul R. Steindl said:

> There is a new danger to public safety on the streets of Chicago--the cellular car telephone. I saw a young man in a large automobile trying to make a left hand turn … steering with one hand and talking on the telephone. He … swung too wide and ended up on the sidewalk. … I also encountered another motorist on the phone. This guy was driving a Jaguar. … He was the type who has to wave his hands around while he talks, and was holding the phone to his ear with his left hand, performing various gestures with his right and steering, I guess with his knees. Then, after about a mile of doing this … he produced a notepad and, traveling at 35 miles an hour, proceeded to write, pencil in his right hand, notepad in his left … still, no hands on the wheel. (14)

Steindl concluded: "A moving automobile is not an office--at least it shouldn't be one for the driver." Driver safety

received attention early from the mainstream press, and this continues today. Safety wasn't the only concern, however. Some technology-averse journalists lamented the loss of privacy and solitude that cell phones promised to bring.

Old customs die hard. The logic of business efficiency was countered by the passion for privacy. No more of a "mossback" on the subject was William Safire of the New York Times. In a December 1984 essay for the New York Times, Safire called car telephones "a horror show:"

> … I think the invasion of the sanctity of the personal automobile by the most intrusive instrument yet invented is an abomination and a horror show. … Comes the telephone in the car, and all that freedom is finished. We will all become always-reachables, under the tyranny of the telephone in the dominion of the dialed.
>
> Why do you think they call the mobile phones "cellular"? Because each geographic area is considered a cell, a word previously most often associated with prisoners and Communists. Ah, the cellmasters say, it's all voluntary. You don't want a telephone in your car, you don't have to have one. That's what they said about bathtubs. And telephones, and color television

> sets, and video recorders and boiling water faucets. You don’t have to have them, but if you don’t, you’re a pariah. The day is coming when your boss will say “Whaddya mean, he’s in his car--get him on the cellular phone!” and you better be there in your cell. (3)

Despite such concerns, popularity grew and, by 1987, long gone were the days when cellular mobile telephones were reserved for the “rich and powerful” (Stoffel 11). The country was signing on to cellular in a big way.

In October 1987, the cellular telephone industry added its one millionth customer, hailing the event as a “turning point for the 4-year-old business that will soon push prices down” (“Busy Signal” 10C). By comparison, CTIA president Robert Maher said, “It took more than twenty years to hook up one million regular telephone customers (10C).” John Brennan, CTIA’s chairman, noted cellular’s rapid rise: “In just four short years, we have seen service spread from two cities to 150 with 240 systems, making cellular service available to 65 percent of the population” (10C). The cost for a cell phone was dropping from $3,500-$4000 just four years earlier to as low as $1,000, and service prices were falling in most cities as well. With the advent of portable cellular phones, the anticipation of a second

generation of lightweight portables, and the extension of cellular to rural areas, industry leader Maher predicted a “new age of ‘personal communication’ -a nightmare to some, perhaps- in which every person will have a ‘universal’ telephone number, reachable whenever he is, in the car, on the farm, on a boat, taking a walk” (Maher qtd. in Reinhold 8). While some had a hard time accepting the loss of privacy and solitary time, more people than ever recognized the phone not only as a business necessity, but as safety net in case of an emergency.

By mid-1989, as phase one of the wireless revolution was nearing its end, more than two million people in the U.S. used cell phones (“CTIA’s Semi-Annual”). The cost for a car telephone had dropped to $400. Although portable cell phones--such as the Motorola Micro TAC, which weighed 10.7 ounces and fit in a shirt pocket--were expensive at almost $3000 each, costs were dropping and larger portable varieties were available for as low as $600. Even in 1989, while portables accounted for only a fraction of cell phone sales, it was widely expected that prices would decline and portables would come to dominate the market. The gross outlines of the novel era are easily constructed from the published works by the industry and mainstream press, but the textured imagination of the period requires a closer encounter with the press’s narratives that the new world mobile phones

were spawning. Three representative press articles have been selected to illustrate how the mainstream feature press helped the public understand the new phenomenon called cellular telephone service.

The New York Times article of October 14, 1983, headlined “Cellular Mobile Phone Debute” [sic] with a dateline: Chicago, October 13, introduced the public to the country’s first commercial cellular phone service. The author enticed the reader with this opening narration:

> The call to New York was placed from a moving automobile, but there was no wait for a dial tone, and none of the static interference that usually comes with such mobile phone calls. The dialed number appeared as a digital readout on the phone console before the call was connected. And the voices came through crisp and clear.

The novelty of the service was enticing because it outstripped current limitations and leapt over defects known to the older version of mobile car phones.

The future promised even more ease. Telephones might actually become “small and light enough to fit into a briefcase or back pocket without sacrificing range or sound quality.” In the next section entitled “An Estimated 5,000 Customers,”

Ameritech Mobile projects “it will have 5,000 customers on line … by the end of the year [1983], and as many as 12,000 customers by the end of 1984.” By comparison, the “old car telephone technology” operated by Illinois Bell Telephone had only 950 customers and a limited channel capacity which meant that its customers “might have to wait 30 minutes or more during peak times to get a free channel.” Clearly, the new service was better than the old.

The article goes on to explain the advantages of cellular telephone service and increases consumer confidence in explaining how it actually works:

> Cellular radio technology … uses a series of low-powered transmitters placed in “cells” or districts throughout an area. This allows the same frequency to be used the same time by different callers who are driving through different cells. When the driver in one cell passes to another, the computer automatically senses that the signal from the car telephone is fading and passes the signal off to another frequency in the new cell. All this takes place in milliseconds and, industry officials have said, without any noticeable interruption in the telephone conversation. (1)

The computer thus creates a show of flawless ease. Further, “As the airwaves become more congested, the carrier can divide up the cell into new smaller cells, further increasing the system’s capacity.” The fact that such complex systems were well off into the future is not mentioned, fueling desire without bringing up prospects or limits.

The article cites a drawback. The service is very expensive for the average consumer, with the phone “about $3,000 to buy and install” and service costs at $50 per month plus per minute airtime rates of 40 cents during peak time and 24 cents during off-peak times. Not to worry about costs for too long, however, as competition was around the corner. Rogers Radio Communications Services, Inc. had won approval from the FCC to provide competing service in Chicago and “said it expects to charge lower rates early next year.” In case the reader is still skeptical, the author reports on a “demonstration drive” he was invited to view. The functions of the phone apparently justified the price:

> The quality of the call placed to New York was as good as a call placed on a regular telephone. The only minor distraction during the 10-minute conversation was a faint phantom female voice which was overhead for just a second. Varying degrees of static briefly

> interrupted several local calls placed while driving through the Loop.
>
> To use the system, a caller dials on a Touch-Tone radio phone. The digits appear on a display. When finished dialing, the caller presses the send button and the call is completed. Up to 10 telephone numbers can be stored in the telephone's memory and they can be recalled with a single touch of a button. The phone also has a "talk box" feature that lets the caller speak without holding the phone.

The potential to increase one's power through networks and easy access through technology was a lure to anyone working in the complex, institutionalized modern world.

How robust was the cell phone's future? According to Ameritech officials "the market might reach $3 billion by 1990." The press thus strove to bring investors on board with consumers. The article revealed new information, increased consumer awareness of a new technology and helped create an early understanding of its potential impact. Since little is known about the pros and cons at this stage of the technology's deployment value judgments are not offered; rather the article focused on informing and educating its average reader.

In a revolution, forces of change meet resistance. Not all initial press was positive. A second article, written by James Barron for the New York Times, opened an issue that plagued the revolution then and to date. The headline of the article announces the bad news on cell phones: “USE OF PHONES HELD CAR SAFETY FACTOR,” Dateline: Detroit, August 13, 1985. It begins:

> Something unexpected happened while Michael J. Connolly was talking on the telephone not long ago. He lost control of his car. … Driving home from his office here, he dialed a number on his car telephone. He was distracted by the conversation, and his automobile jumped the curb. He was not hurt but it cost him $186 to repair a bent suspension rod.

In later years, the stories on car accidents involving cell phones would not end nearly so well and eventually some communities would restrict or ban the use of cell phones in cars. In the early years of cellular, however, there were relatively few users and virtually no worries.

The fledging cell phone industry had barely begun its ascent when, according to Barron, “The rapid increase in the number of telephones in cars around the nation ha[d] touched off a debate about whether this new convenience could contribute to a rise in accidents.” Safety authorities feared that motorists

would pay more attention to their phone calls than to their driving. “When the driver is distracted, you’re setting up a condition that is bound to create an emergency for someone,” said Frank Kenel of the American Automobile Association. But there’s another side to the story as the author proceeds to state the findings of “a survey of two small groups of drivers, released today in Washington by the automobile association and the American Telephone and Telegraph Company, [which] found that those with phones in their cars reported 2.8 percent fewer accidents then those who did not.” So began the first of a number of debates between public safety advocates and the industries that supply and service cellular car telephones.

Even with the safety issue raised, Barron, still entranced by the novelty of the technology, and offered under a sub-heading “Quality of Service Improved” an update on the cellular phone’s increasing popularity and an education on how it worked:

> The car telephone boom has been brought on by cellular phones, which the Federal Communications Commission says are now available in 66 cities. In contrast to older mobile phone systems, which typically had one antenna for an entire service area, cellular technology works by dividing the area into small cells, each with its own antenna. When a car travels

> […] computers in a master control station hand off the call from one antenna to the next without interrupting the conversation. This generally means better sound quality and more calling capacity than in the old days.

If the new technology is just a more efficient extension of an accepted risk, how bad could it be?

Barron writes for an additional ten paragraphs to cite the advantages of cell phones. He invites users and industry representatives to comment on the use of cell phones while driving, for example: “Business executives say the telephones enable them to make productive use of their time behind the wheel,” “Cellular phone manufacturers and distributors deny that their products cause traffic problems,” and “No one has ever been able to say that there’s a change in driving habits” as a result of the cellular phones. Robert Maher, president of the Cellular Telephone Industry Association (CTIA), offered his view that “using a car telephone was no more distracting than using a cigarette lighter or turning on the windshield wipers,” an argument that continues today. Barron does not make a value judgment on the quotes contained in his article, perhaps to let the reader decide based on the evidence presented. He does acknowledge that “… accident data are limited. A check of police

departments in five major cities found that no statistics were dependent on cellular phones and collisions.” Where there’s smoke there is fire, and the substantial response from the industry suggested that the road was a site of concern. The reader was left to form his own opinion; however, on close inspection, this particular article cited far more arguments in support of the cell phone than against.

Toward the end of phase one, cell phones were on the verge of a rapid ascent into the mainstream public. A third article of the period, written by Jennifer Stoffel for the Chicago Tribune’s “Technology and the Workplace” section on November 15, 1987, tells the story of “Cellular Mobile Phones Easing into the Mainstream” invoking visions of a constant-contact world. “Long gone are the days when cellular mobile telephones were reserved for the rich and powerful,” opens the narrative, which goes on to cite the reasons that “going cellular has become de rigueur for everyone whose time on the telephone means money.” Just four years after mobile cellular phones became available in Chicago, the sight of cellular car phone users was becoming commonplace, to the surprise of early critics who dubbed the phone “an overpriced gadget” and “merely a fad that would never catch on.” With nearly one million cellular car phone users in the United States--a 40 percent annual increase from the prior year of

1986--cellular technology was “changing the way many Americans communicate and do business.” Widespread early use appears to be supported by bandwagon claims: Because everyone is doing it, you should too.

Similar to many popular press articles of the time, the author explained how cellular technology works and why it was an improvement over older style mobile radio telephones. The rhetorical burden was to pronounce the inevitability of a device that was unfamiliar at that time to most people, who had always gotten along with phone calls from stationary sources. Then a cellular user states the benefits of the technology, usually in terms of time and money. For instance, suburban cellular user Bill Pontillo bought his first phone in 1983, and since then “his cellular system has turned his car into an office.” His new ability to be “available at the right moment” had saved time and money for his small business. He was so enamored of the technology that he bought another system: a battery-operated transportable unit. A predecessor of the portable cell phone, the transportable was bulky and heavy, but it traveled on the person and thus served the purpose of keeping in constant contact. Mr. Pontillo soon experienced the inquisitive stares of others: “I brought it in a restaurant with me at lunch and it went off--everyone in the place looked around thinking, who is

this guy anyway?” Almost 20 years later, the same thinking takes place more frequently and more pronounced, to the point of restaurants invoking rules of cell phone etiquette.

The press always covers both sides of an issue, but in context the article then revealed the quality problems that users could experience: static or dropped calls and the possibility that eavesdropping may occur. But these concerns did not deter customers. In fact, Mr. Pontillo recently installed a phone in his wife’s car--for safety reasons.

Why the surge in customers for this relatively new and expensive communication technology? According to Stoffel, growing competition between two competitors in the Chicago market, Ameritech and Cellular One, had prompted discounting. The average price of an installed model phone was now $900, down from $2,000 just two years before. To “lure” customers who were reluctant to spend the initial cash, attractive phone leasing and rental packages were common.

The article predicts a future where cellular rates approach “home rates”--that is, the rates charged for line-based telephone service--and relays six other reasons that cellular technology will continue to be popular, including the “faster and more efficient digital transmission” on the horizon. From the title of the article suggesting that cellular has gone

“mainstream” to the concluding paragraphs citing the cellular advantages, the reader is encouraged to view the technology as helpful, harmless and increasingly within reach of the average consumer. It suggests the possibility that anyone will be able to own a cellular phone; its advantages plentiful, its disadvantages few and soluble. The customer problems in this context are transformed into temporary inconveniences.

For these technology pioneers the future means progress. Change is inevitable: “Anything that improves communication changes the way we live,” stated an industry executive for this article. The reader public was encouraged to view cell phones as tools for improving personal communication. The resultant lifestyle changes that cell phones portended were not questioned, only anticipated.

The Industry Point of View

Industry was busy researching, developing systems and creating the technology the press was anticipating. It also was busy financing, employing, pricing and expanding the business. The years following Chicago’s launch of the first commercial cellular system in October 1983 signaled the reality of cellular

service in the U.S., as most major metropolitan areas launched at least one cellular service.

During this time, the cellular telephone industry was still limited in coverage and less available in mid-size and smaller markets. But the cellular infrastructure was improving at a rapid pace as cell sites and tower placements increased. Phone technology advanced from the installed car phone to an early stage handheld cellular phone. The FCC, charged with regulating cellular phone service, relied on a “structural” model of regulation that promoted its objectives: technological innovation, consumer choice and economical services (Roche ii). The agency sought to “foster important public benefits of diversity of technology, service and price” (Roche 53). The approach fostered competition as established operators, entrepreneurs and speculative investors vied for the coveted cellular licenses which were necessary for building and operating wireless phone systems.

During the late 1980s, the investment market for cellular industry became more established. Well-known investment banks began to issue newsletters and reports on the growing industry (Roche 77). Cellular operators offered stock in their companies to an interested public financial market as a way to obtain

capital to finance new systems. Flush with cash, manufacturers and operators began to experiment with digital technology.

By now, the prospect of owning a cellular license was a lucrative one, and there were many voices competing for advantage. Three industry press articles of phase one will follow to illustrate the issues, concerns and emotions of the period. In the early days of commercialization of cellular radio telephones the landline, or wired, telephone industry had good reasons to celebrate the possibilities that wireless telephony presented but at the same time it had good reason to fear the future. The in-house press of the communication industry was busy with its own unique concerns and anticipations. The first article reveals the mixed emotions of an entrenched wired telephone industry that was about to see its world turned inside out.

RCR Wireless News (RCR), formerly RCR Radio Communications Report (RCR), is a major publication for organizations involved in communicating via the nation's airwaves. Prior to the initiation of cellular service, RCR was primarily concerned with the radio paging industry; however, as history reveals, times were changing. On February 27, 1984, RCR published in its Editorial section an excerpt of a speech given by Donald Porter, director of marketing for Telephone and Data Systems, Inc. The

speech, which was delivered at a United States Telephone Association (USTA) meeting in January 1984, provides an example of an industry insider's early visioning of the promise of cellular radio. Porter began his speech by announcing that "to be part of telephony is a proud heritage." He cited the successes of the landline telephone business in the United States: 181 million telephones in service, three times more than any other country, 1,457 "thriving telephone companies, and 17,000 telephone exchanges "with a good share of those being electronic." Being of telephone company heritage himself, he then posed this question to his audience: "Will your telephone company continue to thrive and, more important, survive with cellular radio?" The question was a critical one for his audience of fellow independent telephone company managers. Porter's answer to his own question reflected the vision, confidence, enthusiasm and risk-taking that helped fuel the wireless revolution in its formative years:

> A telephone revolution is taking place and it is called cellular telephone. You will note I did not say cellular radio--why? Because I believe cellular is more than radio service. This technology will touch our lives with increasing frequency. Tomorrow's telephone customer will be able to place or receive a

> call to or from anyone, anytime and anywhere. … Moreover, cellular technology will permit the implementation of a viable portable telephone service that will attract hundreds of thousands of otherwise uninterested subscribers by liberating them from their vehicles, as well as from their home and office telephones. … What does this mean to the average telephone company? It could mean your telephone company, as we know it today, will become obsolete. Tomorrow's telephone company will be cellular. … The revolution is upon us.

Telephone and Data Systems, Inc. eventually would obtain the licenses for more than 140 cellular markets in the United States. Its wireless subsidiary, United States Cellular Corporation (U. S. Cellular), would become the sixth largest cellular company in the nation. Porter's prediction of the future of cellular radio was remarkably accurate.

Porter continued to address his audience by discussing the FCC-proposed spectrum lotteries for selecting license holders for "markets 31 and below," his particular concern being "how the FCC [would] define the non-MSAs serving areas" (i.e., areas in small markets and rural areas more typically served by independent telephone companies). He offered this warning to his

telephone company brethren: “I stated earlier that both a wireline company and an RCC [Radio Common Carrier] are eligible to serve in any given area. This could mean that you might have to share 50 percent of the customers in your telephone company of tomorrow. Competition will be far greater then anyone envisioned. Cellular telephones will more than substitute for the present wireline system in the suburban/rural areas.” Porter further advised: “Recently, the REA [Rural Electrification Administration] has addressed the issue of cellular radio for rural America. I would suggest that if you are an REA borrower, you might further research this matter.” In other words, the future, for many telephone companies, depended on it. Whereas the public press saw changes in lifestyle, the industry was busy articulating a “logic” of its own structures, finances and futures, assessing the risks and rewards for participation.

Porter’s speech captured the dual emotions of thrill and risk that were pervasive among early insiders, especially the rural telephone company operators who, heretofore, had enjoyed a monopoly. He addressed directly the risk and the potential opportunity for independent mid-size and small telephone companies. Distinguished by an emotional component that was not typical of the trade press, this piece serves to inform an important industry segment about impending technology change and

the burdens or promise that it would hold. The sweeping language is both exciting and foreboding: “The vast service and profit potential of this virtually untapped industry have excited a broad cross-section of the business and financial community: including telephone companies, Western Union, MCI, radio common carriers, broadcasting, cable television operators, railroad, banks, venture capitalists and newspaper publishers.” Many of the entities mentioned do indeed become part of the revolution that unfolds in the two decades to follow, as some are destined to be major players as technologies begin to converge post the millennium, while others do not survive.

Another of the functions of the trade press is to announce and evaluate management and organizational changes of companies within its sphere of influence. A June 18, 1984 RCR article headlined “Ameritech names Strigl” announced “three top executive changes effective May 1.” Typical of AT&T, one management move initiated others in a “domino” effect:

> Robert Barnett, president of Ameritech Mobile Communications, was elected vice president and chief operating officer of Wisconsin Bell: Dennis Strigl, president of Ameritech Communications, Inc., will succeed Arnett; and Herbert Crane, vice president of

> business unit strategy and marketing, will become president of Ameritech Communications. (12)

The article then described the background and credentials of the executives. Strigl, who eventually would become Verizon's president and was interviewed for this study "began his telephone industry career in 1968 with New York Telephone and has held positions with AT&T Wisconsin Telephone and AT&T Information Systems." Such management changes were newsworthy as the cellular industry was growing by leaps and bounds and so were the responsibilities of its executives. Tracking management change was just as exciting as tracking technology and product change.

Just below the Ameritech article on the same page is another piece that is typical of the industry press. Headlined "Reach Inc. named SpanTel" the copy read: "Stockholders of Reach Inc. changed the company's name to SpanTel Corp. during their May 19 meeting here. Also during the meeting five new board members were elected and five re-elected." A quote from the company's president and chief executive officer explains the change: "The name SpanTel more accurately portrays the company's mission the span the nation and globe with 'point to person' telecommunications." The newly elected board members names are then detailed in the following paragraph.

This type of article, which is common in the trade press, serves to share information within and across the field of telecommunications; information is provided that key stakeholders want to know. Who is in charge, what can we anticipate from management changes, and where are our competitors going with their businesses? These questions are fundamentally important to industry insiders. The trade press thus functions as a central repository of facts and figures as well as a vehicle for communicating business strategies and operations results within the field. Taken collectively, these articles inform the industry, excite their passions, generate new ideas and persuade a new course of action. Beyond these internal industry functions, however, the trade press helps industry communicate with and about the government regulations and processes that play a role in the industry's development. According to Tracy Ford, associate publisher and editor for RCR, "We want to be the community for wireless industry executives. We want to be the place where they go to get their news, where they go to get their analyses." RCR had the history and the experience to deliver on this goal; its articles form the "representative anecdotes" for phases one and two.

In the field of telecommunications, industry and government must work together in a historically complex regulatory

framework that governs U.S. radio spectrum allocation and also regulates the nation's telephone systems. The main regulatory body is the FCC. On occasion, the U.S. Congress has its own agenda with the telecom companies, particularly as it relates to taxes. It is not unusual for industry and government interests to conflict and in the event of conflict the industry trade magazine is especially useful in conveying the arguments.

In its August 1, 1987 article titled "Ameritech, CTIA oppose cellular tax hike proposal," RCR chronicles the debate over a federally imposed excise tax on cellular telephone companies. Written by Jeffrey Silva, Washington bureau chief for RCR, the article begins:

> WASHINGTON--A proposed federal excise tax hike on cellular service "could stunt our infant industry's development" and would send "the wrong signal to consumers," said Ameritech president Richard Notebaert in testimony last month before the House Ways and Means Committee.
>
> The proposed cellular excise tax increase is one of several options being considered by the committee, chaired by Rep. Dan Rostenkowski (D-IL), to increase government revenues for fiscal year 1988 and to set ongoing policy for tighter budgetary restraints. If

> approved, the provision would be part of the House budget bill, which also must be accepted by the Senate and signed by the President before becoming law.

The government needed additional revenue and viewed the emerging cellular industry as a good place to secure additional dollars. After all, cellular was viewed as a luxury item affordable only by business and upper income citizens. The excise tax specifically targeted the wireless companies and excluded the wireline telephone companies. “But there is no justification, as listed in the proposals now being considered by the committee, for cellular service to bear a greater burden than its cousins in other sectors of telephony,” said Robert Maher, CTIA president. Ameritech’s Notebaert “stressed that cellular phones are not luxury items or toys-–a key issue before the committee--and that customers view service as ‘a solid productivity tool.’” As evidence that cellular was becoming a “mainstream” product, Notebaert testified that “cellular installations in trucks and vans [had] jumped to 21 percent from less than six percent in three years, a figure used to dispel notions of the glamour image that initially accompanied the industry.” Joining the CTIA and Ameritech at a congressional hearing on the matter were the United States Telephone Association (USTA) and the National Telephone Cooperative Association (NTCA) both of whom opposed

the proposed tax increase, with the NTCA warning Congress of the "potential harm to rural cellular development."

Ultimately, industry lost the battle and the cellular excise tax was increased from three percent to five. In the years to follow additional taxes would be levied on cellular customer bills until the amount of taxes both local and federal would eventually exceed eighteen percent of the bill in many states. The lobbying effort in industry and government would only increase as the industry grew more successful. One of the major reasons that powerful industry associations such as the CTIA exist in U.S. business is to determine common goals among the industry players and help industry work toward those goals. While the excise tax issue was not one of the industry-government battles in which the cellular industry achieved its desired goals, there are examples of successful lobbying throughout the years.

Government plays another role in telecommunications through the standardization process. Few industries have the intense standardization requirements of telecommunications. Nationally and internationally, the airwaves are not only a scarce resource, they also are part of our shared physical public in that people want to be able to transition from one location to another while continuing to use their communication tools

successfully. In the first phase of the cellular revolution, there was one FM analog standard for cellular radio transmission. On the threshold of the second phase of the wireless revolution, many changes were taking place in the industry. Significant among them were industry efforts to select an official digital transmission standard to replace analog. Citing capacity thresholds of analog transmission and interest in bringing new digital services to a growing wireless community, cellular industry officials wanted to “iron out” their differences and avoid government intervention in the standards setting process.

In the fall of 1988, there were more than 1.6 million cellular subscribers in the U.S. with ten to eighteen million forecasted by the end of 1993 (“CTIA’s Semi-Annual”). A third article, written by Jeffrey Silva for RCR, described the sometimes difficult internal workings of industry. The digital standards setting process was underway with cellular operators in larger cities desiring to have “digital hardware available by late 1990” a goal described as “very ambitious.” The process of transitioning FM analog cellular to digital transmission mode was “complex” and cut across “virtually all industry sectors, including manufacturing, carriers, and subscribers.” The entities spearheading the standards setting process were the

CTIA and the TIA, a spin-off of the Electronics Industries Association that was responsible for adopting digital standards specifications. According to Silva, during a two-day Digital Cellular Technology Symposium held during August 1988, industry officials differed over “choice of modulation schemes, speech coding, access technology and intellectual property rights of manufacturers.” FCC Commissioner Patricia Diaz, a guest speaker at the conference, “urged industry cooperation in establishing digital cellular standard but said government involvement would not be inappropriate if progress stalls.”

Of course, industry preferred to keep government away from the debate and hoped to make progress in future talks. Dismayed by the lack of consensus, Jesse Russell, chairman of TIA’s Cellular and Common Carrier Radio Section and director of AT&T Bell Laboratories Cellular Telecommunications Laboratory, said, “Recognizing the talent that exists with the people who participate in the standard setting press I am still perplexed by the fact that we have been unable to produce an official (digital) standard.” In time, a TDMA digital standard would be recommended but not enforced as a U.S. standard. Eventually, CDMA technology also would become a popular choice for many U.S. carriers, while others decided instead on the European model, GSM. Today’s cellular landscape is a patchwork of technology

standards, a situation that some in the U.S. industry feel has been a strategic boon to the revolutionary growth of wireless in the U.S., however that view is not universally held. What is clear from the articles reviewed here is that industry held within its boundaries for discussion significant topics requiring strategic argument and direction. These topics and arguments by necessity spilled into the public sphere for debate and resolution.

While industry was debating digital technologies, digesting customer growth, and lobbying Congress not to increase cellular excise taxes, consumer advertising was evolving from an education mode (how well does it work) to depicting the product in use (who needs it and why). The phone was prominent in the early ads, but by the end of phase one the user appeared as well. The primary user was the business professional, the upscale, white collar man “on the move” who could not afford to be out of touch even for a moment with his important business affairs.

Public Advertising

Advertising can serve as a bridge across which industry pushes messages to the public. These messages attempt to

influence the public on how to think about a product--how it works, where and when it is used, when and where to buy it. In the first phase of commercialization, cellular technology was largely unknown to the public. Similar to the function that the mainstream press played in early years, consumer advertising focused on education and availability.

Advertising is a way to represent the new technology at its best. Ads of the period tell the story of positive change. Three representative ads have been selected. The first ad of phase one appears in the business section of the New York Times February 19, 1984, shortly after the launch of cellular telephone service in New York City. The advertisement is for cellular service by Nynex Mobile Communications, a company that merged with Bell Atlantic Mobile in later years to become today's Verizon Wireless. There are six key elements in the quarter-page ad: a company name and logo; a large headline; a question in smaller text (under the headline); a short explanatory paragraph next to the question; a photo of a steering wheel with an implied driver and his car phone; and two company listings at the bottom of the ad.

The core of the ad is a large headline, "NYNEX Mobile Communications (logo) cellular car telephones. … We've got 'em," Beneath the headline and adjacent to smaller text is a crude

photo of a man’s hands holding a large thin steering wheel attached to the dashboard of a car. The implied male driver wears a starched white shirt covering his forearms to the wrists. His left hand grips the top left of the steering wheel tightly while his right hand holds a large rectangular phone receiver against the steering wheel. The phone is not in use; it is apparently positioned for show. Its shape is rectangular, with the Touch-Tone pads on the front of the receiver handle. The phone does not have a cord; it is not clear how the phone is powered. It fits easily in the man’s right hand; however, he cannot hold the steering wheel while simultaneously holding the phone. It is not clear to the reader that the man is actually driving the car, but the strong grip of the left hand on the wheel implies an active physical state. There is no indication of the manufacturer of the car phone, nor is it clear how the phone might actually be used while driving. The photo seems to imply that the user can talk and drive at the same time, but does not directly portray it.

The headline comprises two main features: the NYNEX Mobile Communications company name and logo, followed by “cellular car telephones.” and directly beneath that “We’ve got ‘em.” The headline is multi-purpose; it 1) announces that cellular car telephones are available to the public, 2) states a reliable

telephone company as the provider, and 3) specifies two independent cellular agents for NYNEX. The headline shouts to the reader that a mainstream telephone provider has stepped into the future by offering state-of-the-art cellular telephone service. The announcement is accompanied by a question: “Who is better equipped to introduce you to remarkable cellular technology than your Authorized NYNEX Mobile Communications’ agents?” The answer is found in the text directly below: HBE Henry Bros. Electronics, Inc. and NYCELL New York Cellular Radio Corporation, both of whom “offer many years of experience in the mobile radio communications field--selling, installing and servicing”--a specialized activity. The text goes on to explain the benefits of the product: “… Stay in touch, in control and in action while driving in your car.” It calls the reader to action: “You can learn about this exciting new communications breakthrough today” with a free demonstration at either of the two business agents’ locations. The idea is that the car telephone allowed the businessman to maintain his productivity and be in control at all times. By its placement in the business section of the newspaper, the ad appealed to a specific target, the white collar, upscale business executive. Price is not mentioned. The main message is about trust, reliability and

availability of the provider and the product. The secondary message is about mobility, productivity and control.

The user's world during this phase was anticipated to value success, power and money. The purpose for staying in touch was pure business. The "many years of experience" in mobile communications message in the ad played to fears that car phones could be poorly installed, resulting in car damage or reduced call quality. With no mention of price, the phone was anticipated to be expensive; no discounts. The customer had a choice of two experienced NYNEX agents who offer six locations across New York and New Jersey. Unlike the present, twenty years ago there were relatively few locations that sold and serviced cellular phones.

The phone's features are not highlighted in the text because they were secondary to the main issue: Will the phone work? The ad sought to reassure the user that the product and service would work; it was certified by NYNEX. Beyond this, the ad plays to the power aspirations of a business executive who is always in motion, always in control.

NYNEX. Advertisement. New York Times. 19 February 1984.

REPUBLIC'S MUTUAL FUND STRATEGY OUTPERFORMS THE MARKET.

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1. 9 consecutive years of positive returns for clients seeking both growth and income.
2. Results that outperformed standard market indices for 7 of those 9 years.*
3. Compound annual returns (includes both dividends and capital appreciation) of 15.7% for the last 9 years, 17% for the last 5 years.**

Have your investments performed that well, that long?

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If you wish to invest $150,000 or more, then you'll want to attend a seminar on how your assets can be managed by Republic National Bank of New York. Michael D. Hirsch will outline and explain his mutual fund investment strategy. And you'll have a chance to find out how we can meet your specific objectives. For details call Rachel Levenberg (212) 930-6264, or write her at Republic National Bank of New York, Dept. T-19, 452 Fifth Avenue, New York, NY 10018.

*The comparative index is a blend of the S&P 500 and Lehman Bros. High Grade Corporate/Government Bond Index.
**Results include reinvestment of dividends and income. Past performance figures are no guarantee of future investment results.

Republic National Bank of New York

NYNEX Mobile Communications

cellular car telephones.

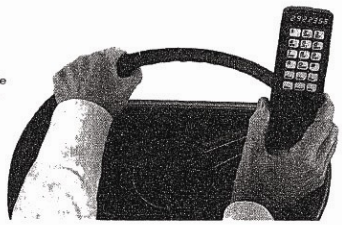
We've got 'em.

Who is better equipped to introduce you to remarkable cellular technology than your Authorized NYNEX Mobile Communications' Agents?

HBE and NYCELL offer many years of experience in the mobile radio communications field—selling, installing and servicing. So, when it comes to a cellular mobile phone for your car, come to the companies that are authorized to provide cellular service by NYNEX Mobile Communications.

With a cellular phone you will stay in touch, in control and in action while driving in your car.

You can learn about this exciting new communications breakthrough today. Call us for more details or a free demonstration. We know you'll agree that there isn't anything as efficient and reliable as cellular phone service from NYNEX Mobile Communications.



NYCELL
New York Cellular Radio Corporation
Brooklyn, Queens, Nassau, Westchester
212 361-0601

HBE Henry Bros. Electronics, Inc.
Paramus, NJ • Union, NJ
201 261-6600

Authorized Agents for NYNEX Mobile Communications

Not all advertisements appealed to the individualist driving for what efficiency can offer. The second ad, by NEC, a cell phone manufacturer, appeared in the New York Times in December 1985. This quarter-page advertisement comprises four basic elements: a headline-grabbing aphorism, a paragraph-long persuasive message, a list of cellular phone offices in the New York area, and a picture of two NEC cell phones.

The core of the ad relates a large headline, “Carry on the conversation.” with what appear to be two black boxes, each a portable phone and its battery. The telescoping antenna that intersects a vertical handle on the boxes makes the unit resemble a transportable radio, with a phone on top connected to the box by a spiral telephone cord. From the contemporary point of view, the devices look heavy to carry, clunky and complicated. The NEC logo on the side, while clean cut, is undistinguished. There seems to be little attention given to the aesthetics of the device; its power is in its promise to function.

The headline grabber is in the title, which takes up a quarter of the ad: “Carry on the conversation.” The aphorism suggests multiple means. With these devices, you can carry on the conversation, you want to carry on the conversation, you should carry on the conversation and the phones keep you

connected. The headline’s call is echoed in the passionate prose elaborating the appeal of the new technology. “Go ahead, keep talking. Carry an NEC Portable, and you’ll be able to talk on the golf course, at a construction site, or in a taxi.” The idea here, and the one that appeared to capture the imagination of the American public, is mobility. The telephone had overcome space with its network of connections, but people had to access it by going from point to point. Here, mobility is defined by presenting an array of sites that suggests a full range of interaction to connect a busy, productive person across his day of leisure, productive work, and key contacts--with associates back at the job or family members waiting at home. Mobility in this world is masculine, muscular and on the go.

The user’s life world is anticipated to highly value power and contacts, prerequisites for staying in touch with places and people that matter. Inferior products play to anxieties that are spatially represented as beyond the range, the failure of the product in outlying areas. The customer is given a choice as to how far he wishes to be in control, by four-hour or eight-hour boxes; the comparative weight and cost of each is not mentioned in the ad.

The product is “loaded” with new features that give “instant access,” the aesthetics of which are less important

than the utility. The anxiety of where to get one or how to use it is satisfied by the listing of locations at the bottom of the ad where one can get a “hands-on demonstration.” Sales sites become training sites--reassuring the product user who is investing a lot of money in an untried and unfamiliar technology.

The star of ad is the technology. The phone itself is the center of attention and the object to be desired. The phone was the device that could transform lives in particular ways, even while it relied on the networks to make the service work.

NEC. Advertisement. New York Times. 10 December 1985.

Display Ad 70 -- No Title
New York Times (1857-Current file); Dec 10, 1985; ProQuest Historical Newspapers The New York Times (1851 - 2003)
pg. D6

The third ad of phase one appeared in the New York Times in December 1987. This half-page ad, by Metro One, a cellular operator of the time, contains six elements: a holiday-themed headline, a photograph of a business man next to a taxi driver, a picture of a Motorola portable phone, persuasive text in the form of two paragraphs, the logo and phone number for service provider Metro One, and a list of the Metro One authorized agents.

The core of this ad is the center photo showing a New York taxi driver leaning out of his cab's window looking at a businessman speaking into his portable phone. The businessman is middle-aged, wearing a dark suit with white shirt; he appears to be talking into his Motorola portable phone just before entering the taxi. The man is in motion, poised for the getaway. He holds his phone several inches away from his face, which allows the reader to see its features but seems awkward from the user's point of view. Perhaps the phone has just rung and he is lifting it to his ear. The portable phone itself, a popular model in its day, is further highlighted in its own photo beneath the center photo. Here its size is larger, its features more clearly defined; an ear piece, mouthpiece and visible calling buttons, including Power, Send and End. A large black antenna is permanently raised above the top of the unit. This Motorola

phone, despite its larger size compared to phones of later periods, was very popular from approximately 1986 to 1988, until it became dated and was replaced with smaller, lighter models. The Motorola name is not apparent on the phone itself; it is revealed in the paragraphs of smaller print next to it. The phone is small enough to fit easily in the briefcase but very large compared to contemporary portable cell phones.

The ad headline promotes “THE GIFT THAT KEEPS ON RECEIVING … LOUD AND CLEAR, ANYWHERE.”--a clever take on the “gift that keeps on giving” theme, just four days before the Christmas holiday. The seasonal time locks in a sense of uniqueness that envelops the user in a postcard moment. The emphasis is on loud and clear and continuous connections, assuring the reader that this expensive gadget is reliable. The man and the phone are on the go. “The Motorola portable phone goes where you go. In the car, on the street, in a cab … it’s business as usual. It fits conveniently into an attaché case and weighs only 28 oz.” Though the phone will make a great gift, this is not “another executive toy here. We’re talking about a valuable business tool …”--one that boasts “state-of-the-art” features, made by one of the most recognized names in mobile products. With this phone, you are unfettered; personal mobility is newly defined by the portable

personal cellular telephone. Thus, pleasure and efficiency join hands in the new world.

The cell phone user in this ad is still anchored in the business world, a world in which time, connections and productivity are highly valued. The cell phone is a working man’s tool, expensive but worth it. Notably, the list of authorized agents has grown substantially from a year ago when only a handful of agents might exist; now, in 1985, more than forty locations in New York and New Jersey are selling cell phones. Auto dealers, radio and electronics stores and even department stores were selling phones, alongside the service providers and their independent cellular agents. The technology, more established at this point, was known to work reasonably well. The element of portability made buying and selling more convenient and efficient. The phone did not have to be installed to work.

The last element of the ad is a clip-out coupon in the lower right corner, a mail-in option to simplify buying. The coupon header said, “METRO ONE, A member of the Cellular One network.” along with its tag line, “The car phone service that means business.” The prospective user could check one of two boxes: “I want to sign up with Metro One. Please Call Me” or “I’m interested, please send more information.” It was no longer

necessary to go to a sales center; the cell phone could be sent directly to the customer. The star of the ad is still the phone; the taxi driver adds urgency and interest. Familiarity with cell phones has grown. Cellular technology is being accepted; the transformation continues without wires or cords, bringing users into the future of cellular radio.

Metro One. Advertisement. New York Times. 21 December 1987.

Display Ad 39 -- No Title
New York Times (1857-Current file); Dec 21, 1987; ProQuest Historical Newspapers The New York Times (1851 - 2003)
pg. C5

THE GIFT THAT KEEPS ON RECEIVING... LOUD AND CLEAR, ANYWHERE.

Let's face it, we're not talking about another executive toy here. We're talking about a valuable business tool from people who are in the communications business: Motorola and Metro One. State-of-the-art cellular equipment* from Motorola and cellular telephone service from Metro One. A winning team whose products and services are a matter of record.

The Motorola portable phone goes where you go. In the car, on the street, in a cab . . . it's business as usual. It fits conveniently into an attache case and weighs only 28 oz. The Motorola portable phone and Metro One service, a combination you can depend on. Visit your nearest Metro One agent . . . and walk away with a portable cellular telephone for the holidays.

* Metro One digital cellular network service supplied by Motorola.

Motorola Portable Phones are available now from these Metro One Authorized Agents:

NEW JERSEY

All Points Marketing
1200 W. Chestnut Street
Union, NJ 07083
201 964-7600

Cellular Phone Centers
790 Franklin Avenue
Franklin Lakes, NJ 07417
201 891-9595

Communications Service
1152 Route 10
Randolph, NJ 07869
201 584-0666

Drive Phone
37 Spring Valley Avenue
Paramus, NJ 07652
201 843-6400

Frequency Plus Corporation
385 Old Bridge Turnpike
East Brunswick, NJ 08816
201 254-0976

Metro Repeater Service
272 Hudson Street
Hackensack, NJ 07601
201 342-1843

Mobile Cellular Systems
273 Route 46
Mine Hill, NJ 07801
201 361-9800

Mountain Communications
239 Main Street
West Orange, NJ 07052
201 736-2020

Pro-Tec
523 Raritan Center Parkway
Edison, NJ 08837
201 225-0975

Royal Communications
112 Main Road
Montville, NJ 07045
201 335-0300

Terret Communications
Route 22 East
Whitehouse Station, NJ 08889
201 534-4477

NEW YORK METROPOLITAN AREA

AAT Communications Corporation
1854 Hylan Blvd.
Staten Island, NY 10305
718 987-4000

Apex Information Systems, Inc.
177 Flatbush Avenue
Brooklyn, NY 11217
718 636-1400

Cellular Car Corp.
460 W. 35 Street
New York, NY 10001
212-736-6500

Direct Cellular
401 Broadway
Suite 805
New York, NY 10018
212 431-5252

Eastern Communications
48-14 36th Street
Long Island City, NY 11101
718 729-2044

Essco Electronics
56-37 59th Street
Maspeth, NY 11378
718 894-8000

H.L. Dalis Incorporated
35-35 24th Street
Long Island City, NY 11106
718 361-8700

Mannard Communications
56-37 59th Street
Maspeth, NY 11378
718 326-2000

New York Communications Company, Inc.
53 West Cedar Street
Poughkeepsie, NY 12602
914 471-5520

NRS Communications
50 20th Street
Brooklyn, NY 11232
718 499-4141

Portronix
2831 Cropsey Avenue
Brooklyn, NY 11214
718 372-2900

Repeater Communications
462 West 35th Street
New York, NY 10001
212 736-6500

Sound Effects
340 East 76th Street
New York, NY 10021
212 737-1122

Stark Communications
250 Main Street
Brewster, NY 10509
914 278-2636

Telecom Radio
134-25 33rd Ave.
Flushing, NY 11354
718 939-2701

Worldwide Electronics Corp.
1208 Bay Street
Staten Island, NY 10305-0004
718 448-1717

NASSAU

Audio Mobile
31 Sheer Plaza
Plainview, NY 11803
516 454-8803

Car-Tunes
609 Sunrise Highway
Bellmore, NY 11710
516 221-0304

Famous Make Communications
234 Newtown Road
Plainview, NY 11803
516 694-1070

Mobiltel Corporation
611 Glen Cove Road
Glen Head, NY 11545
516 676-2870

Vast Cellular
81 Columbia Avenue
Cedarhurst, NY 11516
516 569-5840

SUFFOLK

Cellular Telephone Products
1565 Ocean Avenue
Bohemia, NY 11716
516 567-9301

J & J Mobile Phone Center
252 West Jericho Turnpike
Huntington Station, NY 11746
516 385-4141

WESTCHESTER

Auto Concepts
447 White Plains Road
East Chester, NY 10709
914 779-8000

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Chapter Summary

The first chapter has reviewed the initial phase of the revolution. This is a time of great anticipation, but the reality of the emerging use of cell phone technology enters into discussion from the perspectives of different medium. The mainstream press situates cell phone in the context of pro and con, give and take, the way the press typically address issues, in this case a novel technology that promises to change what people see, say, and do in public. The context of the car is featured in part because this is where cell phone first began, and the question of accident disrupting mobility--at another's expense--is the first normative issue to be debated. Yet, the attention drawn is on the whole positive because the promise of extension is imagined to be so great. Heralding the future as inevitable helps make the future envisioned seem so, in spite of its defects. While the press evaluated ends served by the technology, the industry was concerned about its means.
The industry trade magazines shared news sometimes as early gossip about who was in and who was out, always as information as statistics became translated into the signs and charts of success and power. Speeches articulated a future to come and essays debated the means it would take to build the institution,

with government involved. Finally, advertising shifted the message of revolution from a public debate and an industry-government relation to that of developing personal feelings and motivations to adopt the technology. Given the expense of early phones, the appeals suited flattery of elite groups, and working class users who used communication as a tool to do business in their daily travel. The communication of revolution was in agreement that changes were coming; the different strategies of appeal braided together a strong message of expectation. These expectations would continue to unfold and the message would continue to be modified in the middle phase, featuring the great success and vast dissemination of the new technology.

Chapter Three

Phase Two, 1990-1998: Cell Phone in Revolutionary Triumph

In the second phase, the technology improved, coverage expanded, and consumer demand vaulted ahead of forecast. Digital technology was introduced in several competing formats. The government undertook a major move to increase market competition by auctioning additional “personal communications services” or PCS licenses. Cellular operators sought economies of scale and grew by acquiring the smaller players. Meanwhile, a significant health controversy threatened the public and the industry. In spite of the controversy, the middle period is a story of nearly unlimited growth in use among consumers of a phone with a style distinctive enough to define the era and yet become part of everyday life—-with promises of more changes to come.

Phase two features the growth phase of the wireless revolution as the networks of new communications technology become part of everyday American life. The dynamics of phase two reflect tensions in the industry between regulation and competition. For the consumer, there is a fear of an unknown health risk mitigated by desire to be part of the wireless revolution. The service now appealed to, and could be afforded

by, a larger public, the demographics of which had grown substantially since the late 1980s and early 1990s.

The Public (Mainstream) Press

In phase two, personal safety, ease of use and affordability persuaded people to buy, buy, buy. Phones were reduced in size (small enough to fit in a pocket or purse) and coverage areas were expanded across the United States to include all major metropolitan areas and some rural areas. The audience for cell phone connections began to expand beyond its initial venue of driven, upscale executives to include a greater variety of the purchasing publics. While purchase fees and use rates were still high new purchasers found the cell phone to be a legitimate emergency tool, as well as provide a certain “peace of mind” by enabling people to keep in touch while mobile. The cell phone became in the eyes of the public, industry, and consumer an increasingly available and reliable supplement to stationary phone availability and use. As a supplement, the new technology filled in places and times where users would otherwise be unconnected to the social world.

Several developments contributed to public acceptance at this time: 1) technology advancements resulted in a portable,

lightweight phone small enough to fit in a pocket or purse; 2) coverage and roaming procedures were enhanced; and 3) AT&T introduced a “one-rate” pricing plan that lowered airtime prices for the consumer, a move which competitors quickly followed. These events transformed airtime pricing models through simplification, which had the effect of stimulating use among existing users and enticing new users to join in. Customers continued to subscribe at a rapid pace, with customers growing 438 percent between 1993 and 1999, to more than 86 million (“CTIA’s Semi-Annual”). In retrospect, growth seems inevitable, but the future was far from clear at the time.

In early 1993, the eruption of the cell phones and cancer controversy scared the public and threatened the industry’s long-term growth. A lawsuit had been filed in Florida alleging that the late Susan Reynard “had suffered a fatal brain tumor due to her repeated use of her cellular telephone” (Carlo & Schram, 2001). On January 21, 1993, Larry King (host of the television show, Larry King Live) interviewed the deceased woman’s husband, David Reynard, as well as various industry and government representatives, about the suit. Other television networks and newspapers picked up the story about the possibility of a link between cell phone use and brain cancer.

The public debate over whether cell phones imposed a cancer risk thus began in earnest in the winter of 1993.

Major newspapers and networks covered the story as it unfolded and the industry scrambled to react. On January 25, Motorola, Inc., a major cell phone manufacturer, held a press conference, attempting to assure customers that there is no link between their cell phones and cancer. Under the story line, “Cellular phone firms fight tumor charges,” USA Today quoted a Motorola executive as saying, “The products we ship are implicitly safe. We’ve done a lot of research on this because at Motorola we are concerned about the safety of our customers” (Schneidawind 1). Despite such reassurances, in fact, no one knew whether cell phones were safe. There wasn’t sufficient evidence for anyone to make a claim one way or the other.

On January 30, 1993, the New York Times reported that the industry’s main trade association, the CTIA, would finance new research into cellular phones. Two days later, on February 2, the New York Times published another article describing the limited scientific studies related to cellular phone frequencies. In the article, Dr. Elizabeth Jackson, acting director for the Center for Devices and Radiological Health at the Food and Drug Administration, expressed some caution, noting

the “dearth of relevant data,” while saying, “We can’t give a blanket assertion that the phones are safe” (Jackson qtd. in Angier 1). Cell phone manufacturers, eager to calm the public, attested to their compliance to electromagnetic emission guidelines set by the FCC. Critics then complained that the FCC standards for cell phone electromagnetic emission guidelines based on “… highly educated assumptions [more than] than hard facts.” The Cellular Telecommunications Industry Association (CTIA) took a proactive stance, saying it had “asked the government to convene a panel of disinterested experts to review the documents already available” (Angier 1). In the years to come, the CTIA would wage a public relations battle to protect the industry from fallout from the health scare.

As the issue gathered steam, newspapers around the country published articles almost daily on cell phones and their potential link to brain cancer. For the first time in the industry’s brief history, the press turned negative. Yet there were bright spots for the industry such as when the U.S. government seemed to rally to the industry’s defense or at least attempt to do its part to calm the public. On February 3, 1993, the Chicago Tribune reported that a 2 1/2 hour congressional hearing on the matter resulted in the government’s conclusion that “while more study is needed, there is no evidence of a link

between brain cancer and cellular phones" (Hazard 1). One FDA official was quoted as saying, "There is absolutely no likelihood that cellular phones could initiate cancer." He added that there is a question on whether use of cell phones "promotes or accelerates already existing brain cancer" (1). With more than 10 million people in the United States using cellular phones, the debate over cell phones and the potential link to brain cancer was not likely to go away soon.

When a product goes sour, it seems that the press acts like an echo chamber, reporting back and forth coverage of the same issue. Whereas the press had heretofore been covering market launches, product development and consumer use in mostly glowing terms, it now found itself with news about which to be more circumspect. Three press articles representative of the topics in Phase Two were selected to reveal the way in which mainstream press continued the cellular story from 1990 through 1998.

By the early 1990s, negative aspects of cellular technology were reported more frequently in the press. Even before the cancer issue arose, the press had created awareness of other problems with cell phones. Our attention now turns to a New York Times article from June 16, 1991, entitled "Users of Cellular Phones Put Privacy at Risk for Convenience." This article

furnished a typical example of the popular press alerting mainstream customers to the risks of cellular use.

The article, written by Keith Bradsher, begins with another anxiety of the cell phone user, not physical safety jeopardized by cancer, but personal security put at risk by eavesdropping. In this article, cell phone users presented examples of the practice of cellular phone eavesdropping, demonstrating how common it had become and how easy it was to accomplish with a simple scanner. Bradsher explained how cellular technology worked and why it was possible to eavesdrop on an unsuspecting user with little risk of being caught. The horror of the circumstance was dramatized by a feud between representatives showing that even politicians were at risk: “The lack of privacy on a cellular telephone call has been highlighted by a dispute between Senator Charles S. Robb, Democrat of Virginia, and Gov. L. Douglas Wilder over the tape recording of a conversation in 1988 that Mr. Wilder reportedly had from a cellular phone.” According to a researcher in radio communications, Theodore S. Rappaport, “If I were a politician, I would never use a present-day cellular phone. … I’m careful when I use the cellular or cordless phone when I’m talking about money or about personal things with my family” (14). Even acknowledging that there is a limit to these fears, it still leaves the user unsettled.

Although lengthy calls between cellular car phones are difficult to tape as a user moves from one frequency to another, the article acknowledged that a shorter call occurring on one base station frequency (i.e., the user is stationary or travels only a few miles) could easily be taped in its entirety.

With the increasing popularity of hand-held portable phones, the stationary user became more commonplace and the eavesdropping risks multiplied. Bradsher warns the public: “The cellular industry minimizes the risks of eavesdropping. But it has privately made strenuous but unsuccessful efforts to persuade the Federal Communications Commission to ban scanners …” (14). The reader is thus cautioned that industry may not be revealing the full story to the public.

The article informs readers that solutions to the problem are difficult to find and even harder to enforce. For example, though a federal law banned eavesdropping on cellular calls, there had been no prosecutions under this law. Worse, cellular companies are exempted from the eavesdropping law in the case in which a cell phone call is being monitored for quality assurance purposes.

Bradsher suggests that the problems will only grow as handhelds become popular. But the reader is given some good news: “As cellular telephone companies install more base

stations to deal with the growing numbers of customers, the tapping of cellular telephone calls made from moving vehicles is becoming more difficult." And, finally, "a new generation of cellular telephones will make interception of conversations extremely difficult" (14). In the meantime, the public message was clear: users beware. Like the cancer scare to be revealed two years hence, this was a problem without actual statistical confirmation; but it did happen to a few people and with the monumental growth of new technology it could start to happen to a lot. The press had another story that depended on little factual research or verification on the one hand, but promoted anxieties about limitless imaginary snoopings on the other.

Invasion of privacy concerns would take a back seat to the brain cancer scare. The issue surfaced in early 1993 and kept writers busy and users alert for the balance of the decade. The next article is typical of how the press handled the brain cancer scare. On January 30, 1993, the New York Times published one of its earliest articles on the topic. Did cell phones cause brain cancer? The problem was articulated: "While there is no proof that there are health risks, there is no research that specifically addresses the effects of cellular phones on the human body and the human brain" (Ramirez 1). Basically, no one in industry, government, or the scientific community had

sufficient information to answer the question. The headline of the article, “Health Claims Cause Turmoil in the Cellular-Phone Market,” suggested that the most immediate and significant impact of the controversy occurred in the financial markets. Truth was assessed by market response, or so the headline would seem to imply. Yet, even as the paper raised fears, it also equivocated on cause/effect relations. Author Anthony Ramirez writes: “So far the health scare’s impact on sales is hard to detect, according to retailers and the operator of a major cellular telephone network. Of the two million subscribers to the McCaw network, 300 to 400 have called to inquire about the possible health danger … and fewer than 30 have canceled their subscriptions because of health concerns, said … a McCaw spokesman.” Eager to calm consumer fears, industry “rushed to insist that there is no scientific evidence to indicate that there is any danger in using the phones.” Balance requires journalists to continue to move between one side of an issue and another. The reader learned that even the experts knew very little about the electromagnetic fields emitted by cellular phones. “Scientists are divided over the malign effects, if any, of these fields and if the science is murky, so is public understanding, especially when it comes to panic-inducing words like radiation and cancer” (1). The few studies on radiation

that had been done, not on cell phones but on devices that emitted higher power fields such as microwave ovens, surfaced to demonstrate that the potential for harm existed, though specific tests involving the much lower-wattage cell phones had not been conducted.

The article concluded the same way it began. No one knew anything for sure. No specific warnings were made and no one was encouraged to stop using cell phones. The article discharged its duty to inform the public about the fears raised by a guest on the television show “Larry King Live” on January 21, 2003, but the judgment on how to think or what to do was left to the discretion of the consumer. Despite the reasonable length of the article, it did not report on all studies or opinions on the controversy. The information was conveyed with a financial audience in mind, as a recap of the issue for those that buy and sell stock. Maintaining a semblance of balance, the article did not suggest a course of action nor induce the reader toward one viewpoint over another; yet it provided good reason for exercising caution. The controversy thus could be sustained. On the one hand, no one could deny for certain that the harms were not true; on the other, no substantial avalanche of harms was visible. Still, there remained the possibility--and the

technology was spreading. The press had struck upon a durable story that could resurface from time to time.

While the brain cancer scare was consuming industry officials and worrying the public, cell phone manufacturers continued to offer smaller and more unique phones with enticing new features. Competition between carriers became more intense. The theme of competition fueled a dual-level type of reporting that, at one in the same time, commented on industry efforts at innovation and economic contests with one another, and discussed what the outcome of such struggles would bring to the consumer. The storyline promoted interest by multiplying complex future options on the individual and at collective levels.

Typical of the dual-level articles is one responding to cellular telephone industry expansion in the mid 1990s, fueled by the emergence of new competitors licensed to provide service by the FCC. The third press article for review is “Chicago Wired for Wireless Technology: Competition Grows; Cellular Firms Add Options, Cut Costs” and it appeared in the Business section of the Chicago Tribune December 2, 1996. The article conveys information about competition, new cellular services, and various pricing options among the growing number of service providers in each market. The cellular industry had enjoyed a fast growth since its inception in 1984, despite the continuing

controversy with respect to the potential link between cell phone use and brain cancer. The public was barraged with a dizzying array of products and services from which to choose: “Cellular services that once did little more than make and receive voice calls now are offering or soon adding voice mail, caller ID, short message paging and a host of other options previously available only on wireline phones.” In this article, Tribune authors Jon Van and Patricia Tennison attempt to clarify for consumers “the many innovations in wireless phone service” but found even the carriers themselves “hav[ing] difficulty deciding just which options to offer and how to package them.” In addition to the original service providers in the Chicago market, Ameritech and Cellular One, newcomers included PrimeCo, Nextel, AT&T Wireless and Pocket Communications Inc. These carriers were either offering cellular services or building and planning a launch in the near future.

The increase in competition was forcing carriers to differentiate themselves by offering creative new pricing scenarios. For example, “PrimeCo stresses simplicity by giving customers essentially one calling plan with two variations: Ameritech and Cellular One offer several plans” (Van, Tennison 1). The authors take the reader through the various calling and pricing options, including a lengthy explanation of the “calling

party pays” option used by paging operators but not yet available in cellular, and new pricing plans that did not require a long-term contract or fixed monthly fees. They outline the choices, educating the reader on new pricing plans tailored to meet individual needs and varying from one carrier to the next.

Van and Tennison encourage users by suggesting that cellular phones could be affordable for even the lightest user. The article continues in an education role as it explains the difference between personal communications services (PCS) and traditional cellular:

> Traditional wireless phone services have been known as “cellular” because of the name of the radio architecture they use. The newer wireless technology also uses the same architecture but is called PCS … largely to distinguish it from cellular. The major difference between the two technologies is that they use different parts of the radio spectrum, but this isn’t something the average customer needs to worry about.

That may or may not be the case as the carriers work to distinguish themselves from the one another. Indeed, some carriers, such as AT&T Wireless, rushed to capitalize on the PCS

distinction in its consumer advertising, as will be revealed in the next section. PCS was new and sounded different from cellular (although the two technologies eventually would be indistinguishable to the end user); thus, early technology adopters would be intrigued. The article made one thing perfectly clear: personal communication technology was available in abundance and increasingly a tool for everyone, and not only for business. The reader was encouraged to enter the world of personal mobility rather than watch it from the sideline. Absent from the article was any mention of the technology's downsides or risks. That subject seems to be left for another day or another writer. This article worked from a perspective that encouraged the reader to find his or her own place in the cellular world. That world was being fast anticipated within the talk of industry-sponsored studies, publications and newspapers.

The Industry Point of View

While the consumer market was thriving during phase two, regulatory developments consumed the attention of the industry press. In the mid-1990s, the FCC began to award additional radio spectrum licenses for personal communications services (PCS), providing for additional competitors in every market. Cellular

systems now covered all the major metropolitan areas. With the advent of new competitors in each market, the price for cellular phones and service continued to fall, enticing a new group of cell phone users. Meanwhile, the industry costs associated with developing digital cellular networks and phones that could work on both analog and digital systems, mounted. The forecasted investment to convert analog phone networks to digital was staggering; fortunately for the industry, consumer demand for phones continued unabated, generating higher stock prices and profits for the wireless investor. This fueled the availability of additional market capital and helped legitimize the continued high level of industry spending.

One of the functions of the industry press is to report on its own health, financially and otherwise. Three representative articles published during this phase have been chosen from the industry news publication, RCR. The first article was published in the “Business and Finance” section of RCR on April 11, 1994. In this article, titled “Cellular Stocks Surging: Further Consolidations to Impact the Industry,” industry financial analyst Frank Moran reported on the financial health of the wireless industry. Looking back on results posted for the year 1993, Moran reported that “the industry experienced explosive growth in 1993 that is spilling over into 1994, reflecting

continued consumer interest … as services have become increasingly more demand-driven and affordable …" (43). Looking ahead, Moran author predicted continued robust growth, a healthy 35 percent growth expected in the number of cellular subscribers for the coming year.

Acknowledging that a major challenge facing the industry would be the increase in competition to come from new PCS licenses, Moran said that "cellular operators [would be] best positioned to provide PCS and dominate wireless market share through the balance of the decade …" (44). The second half of 1994 would see broadband PCS licenses auctioned off by the FCC, followed by a rapid build-out by the license winners "to exploit and/or protect their respective franchises." Further, instead of increased competition weakening profits, Moran predicted that the "net effect competition will create larger market for wireless telecommunications services …" with an expected decrease in service pricing triggering "explosive subscriber growth on all fronts." Cellular operators, with their 10 years of experience in the market, would have the advantage, creating regional and national brands to compete with newly built PCS systems. Supporting the bullish outlook was what Moran called "robust fundamentals" and the potential for "blossoming cash

flow and profitability" by the publicly-traded wireless communications companies.

Such an optimistic outlook no doubt encouraged the major industry players to participate in the PCS auctions to the fullest extent possible. In fact, when the FCC spectrum auctions for narrowband and broadband licenses concluded a few years later, nearly $20 billion would be raised. RCR and its readers were caught up in a whirlwind of buying, building, and selling, the likes of which had never been experienced before. The article supported and encouraged risk-taking in anticipation of unlimited growth and profit potential for wireless operators, not to mention the financial opportunity for investors and financial services companies.

While the financial community anticipated increased growth and profit, the cell phone cancer controversy increased the public profile of the fledgling industry in an unflattering light. Despite the serious questions the controversy raised, however, large numbers of new cell-phone users signed on. Concerned about public reaction to the cell phone scare, the CTIA sought to quell consumer fears. The trade association emerged as a leading force in the effort to manage the unfolding controversy, as it represented a growing roster of service providers and manufacturers.

The cancer controversy not only consumed public press, it also spilled over into the trade press. It was one of the few situations in which the industry allowed a public debate to threaten its internal workings. Shortly after the cancer issue became public in 1993, the CTIA announced that it would conduct research through an independent body of scientists. It hired Dr. George Carlo, a researcher and epidemiologist, who assembled a roster of scientists to conduct research to determine whether the RF (radio frequency) fields emitted by portable cell phones posed a public health problem. With $25 million funded entirely by the industry, the “blue ribbon” panel of scientists, organized as Wireless Technology Research L.L.C. (WTR), was given five years to produce their studies. Initially, Carlo and the CTIA collaborated on the funded research. As time passed, Carlo grew concerned about the research and presented his concerns to the CTIA. Relations between the WTR and the CTIA deteriorated as the two groups disagreed on interpretation and communication of the early findings.

Several years into the WTR’s research effort, a front page article in RCR, on December 9, 1996, revealed a strained relationship between the WTR and the CTIA. Rarely were the industry’s internal struggles chronicled in its in-house organs. For such a subject to make a headline it was significant indeed.

Titled “WTR Scientists Insured from Suits: But Relations may be Tense with CTIA” the article, by Jeffrey Silva, refers to a stalemate between the CTIA and WTR that threatened to shut down the cancer research program. Although the legal coverage matter had been resolved, according to Silva “there [were] strong indications that CTIA and WTR still ha[d] sharp differences that [were] being played out behind the scenes.” The president of the CTIA, Thomas Wheeler, “described as ‘ludicrous’ a claim by a knowledgeable source that CITA wanted to disband WTR as a result of the months-long fight between himself and Dr. George Carlo, head of WTR, over liability …” issues (1). Meanwhile, WTR’s spokesman claimed that “the action by the CTIA’s board [to provide the legal protection to the WTR scientists] is an endorsement of the WTR program and its research into possible bio-effects of wireless telecommunications products” (42). The article cited Elizabeth Jacobson, a Food and Drug Administration official with oversight of cell phone safety, as “optimistic” about WTR’s efforts while acknowledging that “they [the WTR] have a tough road to hoe” (42). Jacobson indicated that she had met with Wheeler to discuss a variety of issues, including her view that more research was needed. “Wheeler, she said, was noncommittal about whether industry would sponsor more RF studies. Jacobson, while playing down CTIA’s alleged desire to

kill WTR, said talk of revamping the research program had been around from the start. Jacobson also said that she had indicated to CTIA that the research program had her “general support” but at the same time she “declined to be pulled into any power struggles between CTIA and WTR” (42).

According to Silva, “The federal government, while saying existing scientific data is inadequate to ascertain whether phones posed a public health problem, declined to shut down the industry after the issue gained national attention” in January 1993. His concluding comment to the story was that a “failure to expand the body of scientific knowledge of potential RF bio-effects could keep carriers and manufacturers vulnerable to lawsuits and exacerbate antenna-siting problems for personal communications services” (42). The article served to update the industry on a sensitive and significant safety topic that had already cast doubts on the technology. The cancer question was a barrier that had to be overcome by industry participants for the technology to continue to be successful.

The dissension between the CTIA and the WTR eventually culminated in the dismissal of Carlo. Still harboring concerns, Carlo eventually wrote a book (with Martin Schram) titled Cell Phones: Invisible Hazards in the Wireless Age, in which he chronicled his view of the events that took place within the

industry, as well as his findings from the industry-sponsored research. Dr. Carlo continues to advocate for cell phone research today and speaks to various audiences about the hidden potential dangers of cell phones.

Silva's article highlights the CTIA's persuasive role in the industry which included balancing increasingly sensitive competitive relationships among carriers and manufacturers with the industry's continuing need to collaborate, especially on matters that threatened the industry, such as the cancer question and driver safety. According to Wheeler, "The role of the industry association in a diverse and growing business is to discover the commonalities and accentuate them to both the industry and the outside world." CTIA also played a key role in the government's highly contentious market licensing process. The association advocated on behalf of the existing carriers while also lending its lobbying power to the newest wireless competitors who had won licenses in the spectrum auctions. By advocating expansion of the market for old and new players alike, the CTIA became increasingly powerful as the voice of cellular.

As PCS auctions progressed under the auspices of the FCC, the realities of the new competitive landscape began to set in with major cellular operators in the industry. The cellular

duopoly that had existed for more than a decade was now an historical footnote. What did this mean for cellular operators? How might they anticipate and manage the arrival of new competitors? A typical industry article addressing these questions was published in RCR January 30, 1995. Not surprisingly, the article strikes a positive tone for the current operators with its headline: “Cellular carriers are positioned for success in new era of PCS.” Addressing the cellular operator who faced a new competitive threat, author Sim Hall posed challenging questions: “What options do cellular operators have in the PCS era? Which winning strategies will smart players use to stay ahead of the pack?” One by one, options and strategies were identified in the article for a reader audience presumed to be concerned about survival in the new competitive world.

The article strove to formulate a model for success or at least ease fears that competition foretold the downfall of the dominant industry operators. Indeed, many current cellular operators planned to, and did eventually, participate in the government’s PCS spectrum auctions by acquiring new licenses to expand wireless capacity in their existing markets or extend coverage into new geographic areas they did not yet serve. Hall encouraged cellular operators to expand their positions:

> Cellular operators can take advantage of the huge expansion of wireless capacity that PCS will bring. Many of the participants in the ongoing broadband PCS auction for 30-megahertz major trading area licenses are cellular operators looking to use PCS licenses to expand the geographic coverage of their systems. Cellular operators may also acquire 10-megahertz licenses in PCS auctions to be held later this year. (53)

Hall suggests that new spectrum purchases could offer existing carriers a strategic advantage in the long run by fostering competition in the local exchange (landline) market. By promoting ideas such as local exchange competition in the industry press, collective strategies for long-term success could be shared. Competitive strategy was not the only issue that industry faced; it also needed to make a seamless transition from analog to digital technology.

In the mid-1990s, as it became necessary to phase analog technology out with digital replacements, cellular carriers attempted to arrive at a single standard for digital technology to no avail. Unlike European countries and much of Asia which had settled on a single standard, GSM, the U.S. carriers were

unable or unwilling to standardize cellular digital technology around one design.

In addition to GSM, two other digital technologies were favored in the U.S.: Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA). The CDMA standard was positioned to dominate digital systems in the United States, as well as certain parts of Asia, although TDMA/D-AMPS is still being used in the United States, and GSM to a lesser extent (Lightman and Rojas 39).

While these technology standards and others that comprise third-generation (3G) digital cellular options have differences they are not particularly relevant to this inquiry. However, it is useful to understand what is meant by the term 3G. According to Lightman and Rojas, 3G “is not a single standard or technology, but an umbrella term for a variety of approaches to bringing high-speed Internet services to cell phone networks. In most cases, 3G [technology selection] will come from updates and upgrades to current systems which differ from continent to continent and from country to country” (88). Digital cellular technologies offered important advantages but each had hurdles to scale before it would be market-ready.

Some industry executives considered the absence of a digital technology standard to be a handicap. According to Don

Nelson, “The state of technology today in the United States is confused because we’ve got TDMA, CDMA and … GSM. One of the biggest problems and cost items in the handsets is all of this differentiation.” Richard (Ric) Prentiss, managing director of telecom equity research for Raymond James and Associates, Inc., agreed: “There could have been more battles. Which would have won, I don’t know. Would it have been GSM, TDMA, CDMA? But there would have been at least a standard. We would have had some economies of scale and there would have been maybe more impetus to say, ‘Could you do infrastructure sharing?’ If you share infrastructure, you’re going to earn a return on capital.” Others in the industry believed the existence of multiple standards provided incentive for industry innovation as manufacturers and carriers competed on digital differences. “I don’t think we would have the array of products and services we have today if the carriers all had one standard,” said Rhonda Wickham, editor-in-chief of Wireless Week. With the absence of a single standard, industry carriers and manufacturers separated into distinct groups that adhered to one or the other technology. For example, the group that favored TDMA technology was the Universal Wireless Communications Consortium (UWCC).

A final industry text for phase two titled “TDMA time: UWCC show talks up GAIT networks,” covered the UWCC Annual Conference

in Orlando, Florida. This May 7, 2001 article in RCR is typical of articles describing major industry conferences, in which the attendees, keynotes and any newsworthy bits of information from speaker panelists were reported in detail. This particular conference “drew a mixed crowd of wireless vendors, operators, developers and analysts to re-energize interest in its brand of technology and to contemplate strategies to scale hurdles in the sojourn to the next generation of technologies” (Omatseye 1). Keynotes and panel discussions discussed devices, services, and technologies including GAIT, a new network being built by Cingular Wireless and AT&T Wireless Services, Inc. as an interim solution. GAIT [GSM-ANSI-Interoperability Team] “combines both TDMA and GSM into one complex network” (Omatseye 1). GAIT technology became the “main surprise” of the show when its primary U.S. backers, Cingular and AT&T Wireless, announced “progress in building the digital networks” that could be ready as early as 2001.

The article proceeded to report additional updates from speaker panelists that would be of interest to both carriers and manufacturers. In industry, the trade press serves a role in conveying technical and other information that would not normally be shared between competing camps. According to the article, Kameron Coursey, Cingular’s director of networking

development, “hinted that German phone maker Siemens AG was working on GAIT phones,” (Coursey qtd. in Omatseye 46) while Rob Nelson, chief technology officer for AT&T Wireless “hinted that his company was building GAIT networks” following its earlier announcement in fourth quarter 2000 that it planned to overlay its TDMA networks with GSM technology (R. Nelson qtd. in Omatseye 46). Other key industry topics sparked debate among panelists: Did the future “belong to just one device or several devices for different needs and applications?” How would the networks “handle the surge of such technologies as 802.11 and Bluetooth?” And, how would users “reconnect with the networks once they moved out of the coverage areas of these technologies?” The article conveyed newsworthy comments made by conference speakers as the topics were discussed, and, in so doing, shared useful information for industry participants, government, private investors, and the interested public. Because the U.S. had not chosen a single standard, even the manufacture of digital network infrastructures was competitive. Thus, as innovation was triumphing in the market, the shape and direction of technologies that would come to dominate and expand the revolution were locked in their own form of competition and anticipation.

Public Advertising

Despite the controversies threatening the industry's future, public advertising continued to assert the positive aspects of owning a cellular phone. With new competitors in the marketplace, advertisers focused on lower price points, as well as on highlighting significant advancements in the phones. Representative consumer advertisements of phase two are analyzed next.

Two New York Times ads during the 1990s, reviewed in tandem, exemplify the dramatic equipment price declines that helped propel cell phones into the hands of mainstream consumers. The ads depict early handheld cellular telephone models, the Radio Shack CT301 and the Motorola MC 750, the latter offered by the WIZ Home Entertainment Center. On February 18, 1990, the CT-301 was advertised for HALF PRICE at $499.00 (Reg. $999.00). Two years later, February 5, 1992, the Motorola MC 750, a nearly identical model, sold for only $179.88. The price drop of 64% in two years reflects the rapidly changing nature of cell phone development, diffusion, and competition. The 1990 ad occupied less than an eighth of the news page and was combined with other product specials from Radio Shack. The WIZ Home Entertainment Center ad was slightly larger and nestled

among similar size ads for premium brand wristwatches. The Radio Shack ad comprised three main elements; the WIZ ad contained six. The first three elements of each ad were common to both: the photo of the phone itself, the phone price in large print and the promotional details in fine print. Additional elements of the WIZ ad included a pledge to “beat any competitor’s price,” a list of contact phone numbers and indication of the types of credit cards accepted.

The core of both ads is the photo of the advertised handheld phone and its price. The portable cellular phone, an expensive novelty of the late 1980s, decreased significantly both in size and price between 1990 and 1992. The large text “HALF PRICE! 499.00*” dominates the Radio Shack ad. The asterisk after $499.00 brings the reader’s attention to fine print at the bottom of the ad. The call to action is “Handheld Cellular Telephone Puts the World in your Hand” accompanied by the persuasive text “Fits easily in your briefcase—-only 1 1/2 inches wide, weighs just 28 ounces.” The phone is facing forward, its buttons clearly visible and its large antenna extending into the stereo speaker ad just above. The text above the phone states “CT-301 by Radio Shack.” The fine print that appears in the lowest quarter of the ad distinguished it from earlier ads for a similar phone. The $499.00 price is contingent

on the consumer entering into a new contract for service. The emphasis is still on the price of the phone, not on service or an explanation of the technology, as was common in phase one. The reader is assumed to know how the technology works. Another element common to phase one advertisements, but absent here, is persuasive text about the phone's reliability and quality. The emphasis instead is on the details of price and promotion.

The 1992 ad not only dramatically lowered the phone price, it escalated competitive deal-making to another level. In addition to the aggressive price of $179.88, a "FREE $50 U.S. SAVINGS BOND COUPON" was offered "WHILE SUPPLIES LAST," along with a pledge to beat any competitor's "PLUS 10% OF THE DIFFERENCE IN PRICE OR IT'S YOURS FREE. …" The reader almost needs a magnifying glass to read the fine print, which reveals that the low price comes with numerous caveats and restrictions: "REFUND POLICY DOES NOT APPLY TO CELLLULAR PHONES. NO DEALERS. DOES NOT APPLY TO DEMOS … [AND] ALL CELLULAR PHONES REQUIRE A NEW ACTIVATION WITH A MINIMUM SERVICE COMMITMENT WITH ONE OF OUR CELLULAR PHONE CARRIERS. PHONE WITHOUT ACTIVATION $350 ADDITIONAL." The logic of cost cutting appears to presume that the phone itself was sold as a novel, desirable device. What seems to matter to the ever extending audience is who has the best deal. The issue of the best deal is a complicated matter,

for the new technology promises on the one hand and takes away on the other. The complexity of phone contracts was not understood by many, indentured quite a few with hidden costs, and resulted in a kind of shell game that kept the public in a state of constant switching as soon as new deals became available. Yet there seemed to be symmetry in the special-deal logic of advertisement with the bulk of anticipated users.

These ads, similar to ads of the 1980s, do not show cellular users. The ad placements, in the business and technology sections, portray the product’s anchoring in the business and professional world. The placement by Radio Shack and the WIZ signify the expansion of the agent network for cell phones. Distribution was expanding significantly; everyone could see a profit in this rapidly growing product. Finally, the acceptance of credit cards and the pledge to beat competitors’ prices demonstrate the increasingly competitive sales environment. Cellular agent networks were multiplying, each agent seeking a competitive edge by offering new, easy ways to get connected. It was like prospecting for gold; there was seemingly unlimited potential for profit.

Radio Shack. Advertisement. New York Times. 18 February 1990.

WIZ. Advertisement. New York Times. 5 February 1992.

In fact, the deals were so competitive that advertisements became fueled by hyperbole and novel arrangements for access to the newest gimmicks of participation. The date of the next article is May 13, 1993. “FREE SPEECH” screamed the headline for the cellular portable phone ad. The word free appears again seven times in the body of the ad. What happened to the $1,000 phones and the sale prices of $500 or less? These prices were history. Cellular phones were now “free,” as long as the consumer signed up for a service contract for 24 months at a recurring fee of $39.95 per month. This half-page advertisement contains five key elements: an extraordinarily large headline, a picture of the phone, a persuasive text message, the NYNEX name and logo and, in small print, the sales addresses and contractual details.

The core of the ad relates to the large headline, “FREE SPEECH.” A picture of a portable phone and its adjacent text clarified the message: The phone is “FREE with the Simplicity Plus Plan.” The phone is substantially smaller than earlier models and features a flip-open panel on the lower edge. The antenna casing atop the phone is short and stubby, concealing a slender pull-up antenna not obvious to the reader. The aesthetics of the phone are trendy and hip, a big improvement

over earlier models. The headline grabber takes up a third of the ad. The “FREE” phone promotional offer draws the eye; the persuasive text validates the impressive offer. “Just look at what you get for $39.95: Basic monthly service fee, 125 minutes of talk time in your first full billing cycle. Enhanced Voice Mail Service, … and, of course, you get a free cellular phone.” The aphorism suggests more than a free phone. With this deal came personal freedom and productivity. With this phone, “you’re free to place those calls and get those urgent messages which save you time and money. So free yourself to take on the competition with your free phone. And give yourself the NYNEX Mobile Edge.” The phone not only keeps the user connected; it provides a competitive edge.

The idea that captured the attention was the affordability of the phone and the service package. The idea of mobility was expanded to include freedom and value. The telephone had cut all its cords from home to the work place; mobility in this time and space meant freedom.

The user of the cell phone during this time period was anticipated to value freedom and mobility, while the “free” offer specified “unbeatable value” and played to anxieties of affordability. The customer was given a choice of phones: “Choose this Motorola DPC-550 Portable Cellular Phone, or other

high quality models.” The offer is loaded with features and value. The listing of twelve sales locations at the bottom of the ad, plus the toll-free number, made buying easy.

Now, in the 1990s, the star of the ad is price. The phone itself is the center of attention and the object desired, but the price promotion is the hook that moves the eager buyer from desire to action. Secondary to price is the type of phone and the service provider. The reliability and credibility of the service provider, in this case, NYNEX Mobile Communications, was not addressed in the persuasive text. Price promotion is king.

NYNEX. Advertisement. New York Times. 13 May 1993.

FREE SPEECH.

Choose this Motorola DPC-550 Portable Cellular Phone, or other high quality models.

Right now, you can get a free cellular phone when you take advantage of the NYNEX Mobile Simplicity Plus Plan. So you can enjoy free speech anytime, anywhere.

Just look at what you get for $39.95: Basic monthly service fee. 125 minutes of talk time in your first full billing cycle. Enhanced Voice Mail Service, featuring Pager Notification and essential messaging options. Plus other valuable calling services. And, of course, you get a free cellular phone. Choose from three different styles of top quality models, each fully guaranteed and designed to suit your particular needs.

NYNEX Mobile Simplicity Plus gives you unbeatable value.

Nothing is more costly than missed calls and missed opportunities. With NYNEX Mobile cellular service, you're free to place those calls and get those urgent messages which save you time and money.

Give yourself the NYNEX Mobile Edge

So free yourself to take on the competition with your free phone. And give yourself the NYNEX Mobile Edge.

Call 1-800-551-7567
Mon.-Fri., 7:30 to 6pm; Sat., 10am to 4pm.
or visit one of the local NYNEX Mobile Cellular Centers listed below.

NYNEX
Mobile Communications

New York Cellular Centers: 65-18 Fort Hamilton Parkway, Brooklyn • 222 Bloomingdale Road, White Plains • 31-31 Thomson Avenue, Long Island City • 22 Carmans Road, Massapequa 300 West Route 59, Nanuet • 30 West End Avenue, New York • 310 Madison Avenue, New York • 555 West 57th Street, New York • 779A Middle Country Road, St. James • 363 Union Avenue, Westbury.
New Jersey Cellular Centers: 655 Route 1 & Wooding Avenue, Edison • 2490 Route 22, Union.

Simplicity Plus Plan requires a twenty-four month contract. Special introductory offer for new activations only. Offer expires 6/30/93. © 1993 NYNEX Mobile Communications

NYM-NY A2

Cheap phones were a definite angle of sales; but there was another dimension waiting, with the promise of robust, technologically grounded, institutionally vetted service. Good service was connected to status; thus, more for the money equated to greater social standing of the caller, to himself as well as to those he called. Fast forward to August 1997. “AT&T Digital PCS. So many ways to stay in touch all in one service.” Ad size had grown to a full page, and this one featured seven elements: the headline, the phone, the user holding the phone, the persuasive text, the service provider logo, the fine print and the sales locations.

The core of the ad relates to the new digital technology. The technology is portrayed in the words “Digital PCS” and in the photo of the Nokia 2160--flat, rectangular, and featuring a larger window display than prior models. On the window of the phone, in fairly large text, are the words “Pin-Free Access”--a reference to digital’s elimination of personal identification numbers (PINs). The phone is held by an African-American male dressed conservatively in white shirt and tie, smiling broadly while extending his new phone forward toward the reader. The man stands in front of a large building with shiny glass panels--a high-rise professional building.

The headline is not as dominant as in earlier ads. The persuasive text comprises four paragraphs, each highlighted with bold themes: “Only AT&T Digital PCS gives you more ways to keep you flexible and reachable”; “Get more airtime each month for a year”; “Sign up for a $24.99 Service Plan”; and “Enjoy Digital PCS Benefits.” The dominant themes are exclusivity, flexibility, and value. The phone is rich with new features and no longer “free”; however, monthly service plan costs have dropped to $24.95. The main message is about user flexibility--“So you can decide when, where and how to stay in touch.” Batteries are enhanced on digital phones: “The extended battery life lets you have your phone on all day so you won’t miss any calls.” And the calling features commonly associated with a landline telephone were now available wirelessly:

> Call waiting gives you the option to answer an incoming call when you’re on the line. AT&T Caller ID identifies the caller before you pick up. Or you can let AT&T VoiceMail take the call. These advanced features give you more flexibility to communicate anywhere. So you can decided when, where and how to stay in touch.

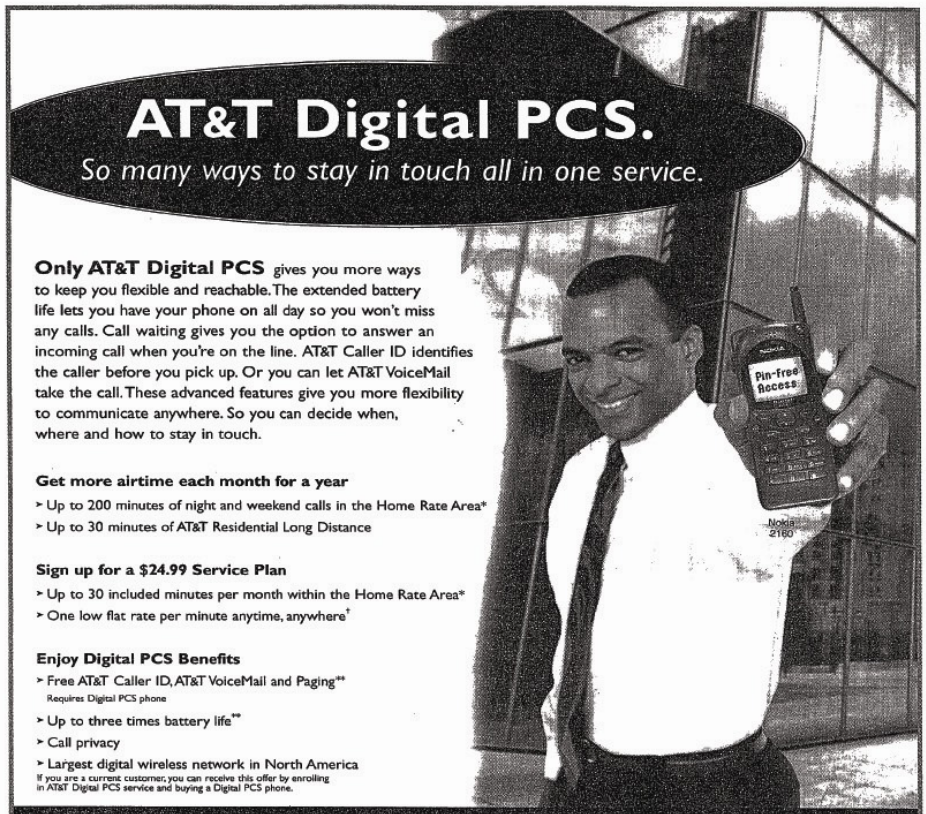
Below the persuasive text is a black band separating the text from the AT&T logo and contact information. On the band are the

words: “With AT&T, wireless is more flexible.” Beneath this appeal the customer found AT&T Wireless Services “1 800-IMAGINE” and a listing of more than three dozen authorized service agents.

The idea that captivates the user in this ad is the sense of “exclusivity” through digital wireless. Less important is affordability; more important are flexibility and control. Here, the idea of mobility continued to evolve--putting the user in control with more knowledge and choices. With more choice came greater freedom, which was at the core of the user’s attraction to the device.

More than ten years after launching cellular service, the star once again was technology. Innovation moved the buyer from desire to action. Secondary to innovation was the price, although value continued as a persuasive topic (e.g., “Get more airtime each month for a year”). The ad targeted not only new cellular users, but current customers. The fine print beckoned: “If you are a current customer, you can receive this offer by enrolling in AT&T Digital PCS service and buying a Digital PCS phone.” The cellular customer could “trade up” to digital. AT&T Wireless Services invited both current and new customers to call “1 800-IMAGINE” ... “It’s all within your reach.”

AT&T. Advertisement. New York Times. 20 August 1997.



In the advertising of the middle period, the expansion of the customer base was multiplied by matching technological variety with systemic opportunity in a competitive way. The array of novel features on the phone constituted more hooks to imagine ways to use options in sustaining the world of making connections by sending and responding to messages. The availability of systems were featured as economic opportunities for participation; while service costs were not cheap, advertising strove to make them seem at least reasonable. With the advent of free phones, one of the last barriers for the general public was removed. The diversity of contractual systems, like the variety of technological connections, created spaces for vast public participation constitutive of a revolution.

Chapter Summary

The middle period of the communication revolution lasted from 1990 to 1998. These dates are somewhat arbitrary, but it was in this time period that the bulk of expansion occurred in the industry. The cell phone went from a novel device anticipated as universally used in the future to a device that became a common fixture of connecting with business, family and

friends. The texture of the revolution evolved through major sources of discussion. The press stabilized its story telling by raising anxieties that required little evidence and research on their own part but challenged the bedrock value of phones: ease and security. Cell phones were increasingly portrayed as a staple of modern life. Industry handled its own set of issues, trying to improve service through standardization and digital upgrades while government expanded competition through the licensing of additional competitors. Innovation in cell phones and creative, competitive consumer-pricing arrangements drove sales to new demographic groups. Advertising went from selling the product as desirable in itself to “best deal” pricing plans that encouraged airtime use and the evolution to digital features. What remained of the revolution was a movement to mature the industry and develop the discourse as a stable, expected part of the American communications landscape.

Chapter Four

Phase Three 1999-2003: Slowdown and Reinvention

In the course of a technology revolution, it is inevitable that controversy arises and is managed by the revolutionaries. During phase two, the cancer controversy unfolded and the industry managed to avert a crisis; however, unanswered health and safety questions remained as wireless technology greeted the new millennium. In phase three of the wireless revolution, the marketplace began to absorb a new set of changes in social communication norms which use of the cell phone had engendered. The cell phone was featured as a personal timesaver, a communicator and a safety net. It appealed to, and could be afforded by, a larger public. In phase three, while a majority of the public had adjusted to the individual convenience of cell phones, the collective changes in our public behavior brought on by the rapid growth in the 1990s were more worrisome.

During this phase, more than 50 percent of the U.S. population would carry a cell phone. However, the rate of growth in new users, one of the key constructs of the wireless revolution, declined as the new millennium dawned. Hampered by a downturn in the U.S. economy, losses in the stock market and reduced access to capital, the wireless industry reconsidered

its financial future. Uncertainty fueled controversy about the long-term survival of six to eight competitive carriers in each market, as well as the one hundred-plus carriers nationwide.

In phase three, arguments continued in technology and consumer safety, joined by new tensions: company consolidations and a push for standardization. Of the major technical standards in play, how many would survive and which would dominate? If there were too many competitors, which would survive? Consolidation often is the sign of a maturing market, not a revolutionary one. Yet some observed that the wireless revolution was not over. Cell phones continued to advance technically and began to offer new features, such as text messaging, games and Internet access. Technological advancements in the cellular network itself, especially the higher speeds afforded by digital communication, began to enhance the user experience. The technology continued to change, and users seemed eager to take advantage of new features. Public health and safety concerns remained muted but unresolved.

As in the previous chapters, the revolution will be analyzed from the perspectives of the three conduits of persuasion that fueled it: the industry and its insiders; the public press; and consumer advertising. The study will identify the topics and controversies within phase three that enabled the

revolution and the rhetorical sites in which they arose, as well as the strategies that managed them.

The Public (Mainstream) Press

At the end of 1998, 33 percent of the adult population used cell phones (“CTIA’s Semi-Annual”). In the last six months of 1998 alone, 45,500 people subscribed per day. Consumers were persuaded by lower prices and a realization that cell phones could replace home phones. Despite the rise in popularity, cell phones irritated many people. Cell phone addiction was a growing problem and the "cell yell"--people talking louder than necessary into cell phones--was an increasingly detested phenomenon (Conarroe 15). Cell phones caused disruptions during movies, distracted motor vehicle drivers, and forced people to listen to secondhand conversations. They promoted a “self-important” air, as though their owners could not “risk being out of touch anymore, anywhere, anytime” (Campbell 29A).

While phone etiquette was just in the beginning stages of controversy, driver-safety issues had been brewing for some time. The public press had reported numerous fatal car accidents apparently caused by drivers talking on their cell phones. Cell phone detractors called for legislation to be passed that would

make it unlawful to use a phone when driving. “It is disgusting that we now live in a world where a telephone call is more important than a life” (Pena 16A). Cell phone enthusiasts, on the other hand, proclaimed that cell phones were “critical to survival and peace of mind” (Coulsting 8). In response to those who dislike the intrusiveness of cell phones and their users, Judith Martin wrote, “Cell phones as instruments are neither rude nor polite, but the people who use them make it so. … Pre-existing etiquette rules should still apply: cell phones can be useful and still be politely used” (Martin 7). Throughout phase three, questions of etiquette and safety captured the minds and pens of feature storywriters. Similar to the cited benefits of computers and the Internet in modern life, cell phones were believed to strengthen family bonds, keep parents in touch with children, and “remove feelings of isolation by making ‘home’ exist in cyberspace” (Oberg 11A). The general public had come to believe cellular to be a useful communication tool, almost a staple, necessary for mobility and safety.

The debate over cell phones and brain cancer that began in 1993 continued in the press into the third phase, with calls for additional studies on the effects of cell phone electromagnetic radiation. Research advocates claimed that the limited studies that had been conducted to date were too short-termed to be of

value, and measured customer usage levels that were too low. Studies conducted in the mid-1990s had measured the effects of 2.5 hours of cell phone use per month versus the 20-hour average usage levels occurring by 2001 (Carlo and Schram 15A). According to Dr. George Carlo, scientists looked only at specific “changes in human blood cells and animal tissues” rather than “to clarify what (health) risks may or may not exist” (Carlo and Schram 15A). In December 2000, the public was informed of the results of two powerful studies, one published by the National Cancer Institute and another by the New England Journal of Medicine, both of which indicated that cell phone users were no more likely to get brain tumors than anyone else. The debate over cell phones and cancer risk was not resolved, but the research reports helped calm public fears. Besides, cell phone users now had one more reason to love their cellular phones--entertainment value.

Cell phone entertainment options grew and were ballyhooed by the press’s entertainment sections during phase three because of increased data speeds and graphic capabilities of digital communications. In December 2000, the New York Times cited slow speeds and limited content as major drawbacks of Internet cell phones, reporting that the “mobile Internet seems less and less likely to be a true mobile version of the World Wide Web”

(Romero 6). By March 2003, however, cell phones were a source of music, games and information and offered novelties such as celebrity voice ring tones, built-in FM radios, handheld games and color digital cameras. The mainstream press reports had moved beyond the question of whether consumers would care to use advanced applications to "identifying the right kinds of applications and services people will pay for" (Graham 4D). Entertainment options held the potential to breathe new life into cell phone sales; new uses and habits--the re-imagination of the phone as an instrument of chatty behavior, drifting through public space talking and playing games--were foreseen as coming trends and were hotly debated.

Three press articles of phase three represent the range of topics and emotions as the revolution grapples with its own pervasiveness and its future in the new millennium. Consider a jeremiad-like article in USA Today October 17, 1999. The headline catches the attention: "Rise up (beep!) and fight (beep!) cell phones (beep beep!)." Don Campbell, author and founding president of the Campaign to Rid America of Cellular Phones Over Time (CRACPOT), is in a tirade about the hazards of cell phone use: loud talkers, irresponsible drivers, phones ringing in theaters, restaurants and the like. Campbell starts out bemoaning a "good news" story in the press that describes a

woman rescued from the desert because of her cell phone. Deciding that this kind of press works against his own crusade against cell phones, he is motivated to vent in his own public way: writing an article for USA Today.

Don Campbell's story is the 21st century equivalent of William Safire's assault on cellular car phones in 1984. CRACPOT represents emotions held by a segment of the public that dislikes the intrusions of the cell phone in modern-day life. Campbell writes:

> I believe the cell-phone scourge will soon reach the stage that smoking reached a few years ago. Have you noticed the way smokers now skulk around in alleyways and under stairways when they're trying to sneak a puff? I can see the day when cell-phone addicts will be doing the same thing.

He proceeds to recount three bad cell phone experiences in a single 15-hour period. In the first, his movie theatre experience was disrupted by a ringing phone; in the second, he was nearly hit by a young driver with a cell phone wedged between his head and shoulder. Finally, while in line for coffee the next morning, Campbell reached his limit:

> I heard a woman's rising voice not two feet from my shirt collar: "Marla, listen to me. Listen to me!

> You've got to look at this as a chance for personal growth!" … I gave her my most contemptuous stare, which was wasted … I looked around for supporting scowls. There were precious few. I counted 21 people inside the coffee shop … eight more were talking on cell phones."

Public telephone use had been confined to telephone booth; if not enclosed, the telephone typically was in a low traffic area. Not anymore. Cell phones were now so widespread that they were challenging the norms of public/private communication.

Campbell thought the trend was related to "a phenomenon of the baby boomer '90s": "People are more important than they used to be. How else to explain that there will soon be 100 million cell phones in use in the United States? Who can risk being out of touch anymore, anywhere, any time?" He concluded that "regulators and litigators [will] enter the picture" with laws designed to protect citizens from the hazards of cell phone use; but until then, he asked his readers to help his cause by doing several things to thwart cell-phone abuse: 1) invest in companies that make pay phones; 2) patronize restaurants that prohibit cell phones; 3) refuse to play golf with partners wielding cell phones; and most of all, 4) savor the moments that are cell-phone free. He concluded on a positive note. On a

family vacation, he discovered a cellular-free zone--8000 feet above sea level on the Mogollon Rim.

Campbell's narrative served to remind readers of the values of personal etiquette, public safety and personal responsibility. Campbell believed that cell phone "addicts" had compromised these values and eventually cell phone laws and rules would be implemented and enforced to curtail unacceptable behaviors. His article is full of real-life stories that are entertaining yet serious in its message. He writes with humor and sarcasm about a high-tech, gadget-filled world. His article persuades the reader to think about cell phones as objects that are threatening fundamental values of personal and public life. The metaphor comparing cigarette smokers to cell phone users conveys what the author believes to be an eventual situation in which cell phone use would become regulated and subject to laws and protocols enacted to protect core values of modern society.

Campbell's predictions in the USA Today article (October 1999) are front and center in the new century; but concern shifts from comic grief to tragic loss in an article in the New York Times dated February 18, 2001. The headline: "Deaths Spur Laws Against Drivers on Cell Phones" sounds ominous enough, but the story that follows is worse yet. The article opens:

> Mardy Burns learned the blessings of the cell phone when a stranger called for emergency help from the roadside in Kansas where her 18-year-old daughter, Sara, was in a car wreck. But Mrs. Burns soon learned the curse of the cell phone, too. She said that investigators found that the driver of the wrecked car, who survived, had been distracted while on his phone and crashed, killing Sara and her boyfriend. The 17-year-old driver was not charged with any violation in the single-car accident. “A useless phone call killed my child,” Mrs. Burns, who lives in Independence, Mo., said this week of the 1997 accident. “The driver was talking to some girl on the phone. My older daughter, Vera, was at the scene and found the phone in the wreckage. It was still on.”

Having won the attention of readers, the article proceeds to review the status of various laws prohibiting cell phones while driving a car and the arguments pro and con for such laws. At least eleven laws had been enacted by local governments in 2001, but none at the state or national level. Internationally, there were more laws on the books than in the United States; for example, Japan, Israel, Portugal and Singapore had laws in effect banning cell phone use while driving by 2001.

Few studies were available, and those that existed were debated. Author Frances Clines described one study which found that “using phones while driving increases the risk of an accident by more than 30 percent, but the industry dispute[d] this, citing studies that minimize the risk.” The CTIA stated its official position on the matter, “recommend[ing] deeper research … enforcement of existing laws and an overall emphasis on driver education, not legal restriction, as the best form of cell phone safety.” But according to Clines, an increasing number of studies demonstrated a link between cell phone use and driver distraction. Despite this, the National Safety Council released a new policy urging drivers “to voluntarily not use electronic devices on the road. While emphasizing driver responsibility and the enforcement of existing laws, the council did not support legal restrictions on phones except for a ban on their use by 16-to18-year-old driver-trainees.” The council representative said he was reluctant to burden the police with another sweeping traffic ban “without the public and political support it would take to be successful.” The article ends without an opinion or recommendation. It invites the reader to make his or her own judgments based on the information provided.

“Death Spurs Laws …” begins with a heart-wrenching story but ends rather blandly, neither here nor there in its

convictions. Clines leaves his audience weighing a mixed bag of evidence. His article helps readers integrate their own personal experience with the available facts and decide for themselves what level of government intervention is appropriate. The reader is left to decide which threat is greater: the threat to personal safety or the threat to personal liberty.

If the press imagined a world in which propriety conditions were violated by freewheeling “gabbers” and lamented the possibility of tragic outcomes due to unwarranted distractions, it also jumped to the other side of the new world to deploy the cell phone as a metaphor for a slim, sleekly imagined, rich world of novel connections with people through things. The wireless revolution was featured as a stylistic triumph, the phone its clever, vibrant and hip personal essential.

No less an authority on popular style than USA Today featured a headline story on November 18, 2002 titled “That enhanced device in your hand really isn’t just a cell phone anymore.” Author Edward C. Baig begins the story: “Imagine how much easier it would be for E.T. to find his way back home nowadays. The little extraterrestrial would merely whip out his cell and phone home.” This article leaves tragedy of death by cell phone behind and instead focuses on the fun of cellular phones. Cell phones had “grown up” and the array of features

offered was now well past anything E.T. could have imagined. “A slew of clever devices, many with vibrant color screens and remarkable sound, and several that exploit emerging faster third-generation, or 3G, telecom networks, have the vast potential to alter the universe for mobile communications” (5E). The cell phone was a symbol for the coming “convergence”: an entire array of devices converging to a single, handheld icon of 21st century chic invested heavily in youth culture.

Just a decade earlier, cell phones weighed three pounds and cost $2,000--and that was before adding the monthly calling fees onto the bill. Even then, the older, heavier cell phone was considered to have “vast potential to alter the universe”--and it did, fundamentally changing the nature of voice communication and personal mobility forever.

Baig has some fun describing the myriad ways that cell phones were starting to communicate post the millennium. Many devices on the market “marry mobile phones to handhelds,” taking advantage of 3G cellular networks. Third generation, or 3G, networks were capable of bringing high-speed Internet services to the cell phone. The Treo, for example, “boasts a small but usable keyboard and color screen.” Other phone devices included organizers, browsers, and multi-media software. The article cites a Yankee Group survey of current U.S. wireless users,

indicating only 18 percent used wireless data and the Internet, but predicting that “the new technologies might change that.” Some cell phone users were experimenting with customized ring tones at an average one-time fee of .99 cents, while others customized their screen savers, shot photos with their camera phones or engaged in two-way text messages using AOL instant messaging.

Where would it all lead? Baig leaves the answer to the readers’ imaginations. On the eve of the cellular industry’s twentieth anniversary, the technology had exceeded all expectations for growth and customer loyalty. Baig suggests that the wireless revolution that began many years ago continues on. The reader is not asked to make a value judgment; the pros and cons of wireless technology are not debated. However, the article promotes innovation, as Baig is fascinated by the cell phone and its future potential.

If the press could write in glowing, stylistic confirmation while simultaneously expressing reservations, the industry appeared to be basking in new highs of economic investment and stock prices built on prospects of greater growth to come. Yet, if the 1990s furnished a positive history, tremors were occurring in a fast-approaching future.

The Industry Point of View

As the wireless industry neared the turn of the century, the stock market continued to favor wireless stocks. Between January and October 1999, the Lehman Brothers' North American Wireless Index rose 163 percent, while the Standard and Poor 500 Index rose only seven percent (Alleven). Accelerating customer growth and revenues and the potential for wireless data revenue were the key drivers of investor optimism. Mobile communication was now mainstream, accepted by the majority of the public; increasingly, a "legitimate" technology.

Wireless was "big business" for manufacturers, operators and Wall Street in the 1990s. However, in 2000, the U.S. economy began to turn down, bringing with the stock market and available capital. In the third phase, the revolution appears to fade. Customer growth continued, although no longer at a double-digit pace. The financial community debated the long-term viability of so many competitive carriers. Smaller carriers with limited resources began to sell to larger carriers. As the outlook changed and stock prices for many wireless carriers fell, debate began on which carriers would survive, and why.

The industry attempted to persuade investors that the new digital services would keep the industry growing. Cell phones

with e-mail and Internet access capabilities had been introduced, demonstrating that the convergence of wireless and Internet technologies was not simply hype. Phones displayed graphics, sent pictures, and acted as personal organizers and e-mail communicators. Some had keyboards; others offered cameras and music, as digital technology increased data capacity and speed. Cellular operators and manufacturers rushed to enable the latest innovations.

All the interest in wireless Internet, however, could not overshadow two other key industry topics: new spectrum auctions and 3G technologies. In February 2000, the U.S. government and wireless industry officials agreed on a common set of frequency bands in which to deploy future 3G services; specifically, the 1710-to-1855 MHz band and the 2520-to-2690 MHz band. The agreement would force existing users in these bands to share this spectrum with the wireless industry. It also “emphasize(d) the importance of permitting evolution within bands to advance technology” (Vaughan). Despite the agreement, some in the industry continued to predict a spectrum shortage for 3G because the “designated frequencies already were encumbered by other technologies” (Albright “Don’t Hold”). Throughout 2000, government and industry debated the feasibility of spectrum reallocation, with the FCC studying the 2500-2690 MHz band and

the NTIA studying the 1755-1850 MHz band. Meanwhile, some wireless carriers planned to use existing spectrum to implement a limited set of advanced services using 2G and 2.5G. However, the 2G networks would be unable to accommodate the high-speed, high-bandwidth Internet services (e.g., multi-media graphic and text services) promised by 3G technologies.

Despite these technical challenges, by early 2001, some prognosticators were already citing the beginning of the “post-PC-era.” Mark Leon described the potential growth of wireless Internet as follows: “Right now … there are about 100 million wireless phone subscribers. But only about 1.6 million of these are wireless Internet users” (Leon). The rest of the market was yet to be tapped. Leon and other industry optimists foresaw the 98.4 percent of wireless subscribers not yet accessing the Internet as potential future users.

This potential, along with the speed of change, prompted industry insiders to ponder the nature of the wireless technology to come. Alex Lightman and William Rojas write:

> The seductive lure of the wireless Internet is that it will combine the best of both worlds, mobile voice and data. The Internet will be brought to a new audience, becoming a ubiquitous phenomenon, and the mobile handset will assume a much greater role in our lives.

> As a result, a far greater proportion of GNP will revolve around mobile communications. (75)

The wireless Internet defied a simple definition because of the sheer amount of innovation, growth and change occurring at the intersection of cell phones and the Internet.

Despite such optimism for wireless Internet growth, issues remained unsolved with regard to spectrum availability and interoperability of the competing 3G technologies that could deliver these new services. Even more significant, the year 2001 would bring slower growth in new subscribers, prompting investor concerns. The wireless industry announced their financial results for the end of 2001 into a financial market undergoing significant decline. According to Margo McCall, financial analysts “par[ed] millions from subscriber forecasts and trim[med] growth forecasts” based on carrier pre-announcements of slower wireless subscriber growth (“Downgrades Launch”). Market unrest following the September 11, 2001 terrorist attack on the World Trade Center contributed to the uncertainty and financial downturn.

Individual carriers came under scrutiny by investors seeking to understand their long-term viability while converging technologies created speculation about new business opportunities. With six national carriers and scores of smaller

carriers competing for market share, the wireless market was increasingly seen as “hyper-competitive.” According to McCall, carriers reporting subscriber growth numbers that failed to meet expectations were severely punished in the stock market. For example, Sprint PCS lost $13 billion due to its shares falling nearly 29 percent from January 2-17, 2002, while AT&T Wireless suffered a loss of $6.3 billion in the same period after its shares dropped more than 17 percent (“Wireless IPO”).

The major industry players, however, continued to look toward the future by upgrading their networks toward 3G. After September 11th, the wireless industry association “re-examined its stance on asking for 200 megahertz of Defense department spectrum and instead (sought) 120 megahertz … enough to allow industry to start building out (advanced services)” (Rockwell). The industry could not demand spectrum that the Defense department might now deem critical to the national systems for crisis communication in the aftermath of September 11th. However, the industry faced severe network capacity issues that resulted in an increasing amount of busy signals, dropped calls and static. The industry needed more spectrums and decided it would be more successful if it scaled back its spectrum request in a show of cooperation with the government.

Manufacturers continued to develop new handset devices that would deliver multi-media messaging capabilities. In November 2002, Sprint became the first U.S. carrier to offer phones with embedded cameras. By late 2003, the color screen and the camera phone would become popular new features and would pave the path for more digital features on the way.

Another of the functions performed by the trade press is to synthesize the significant number of industry events and trends for its reader audience. Three final representative trade articles are selected for the third phase of the revolution. As the technology progressed, the topics of wireless data and wireless internet were use almost interchangeably as industry insiders prognosticated on the future wireless world. In the first industry trade article, titled “Creating the Future Internet” Wireless Week writer Peggy Albright captures one industry tech guru’s fascination and anticipation of new technology:

> “I’m still trying to rationalize streaming video coming down to my palm Pilot while I’m walking down the street,” says IBM’s director of Internet technology, Rich Wall. “But I never rationalized sticking a cellular phone in my ear while I’m driving a car, either.”

His thoughts, according to Albright, characterize how difficult it is to imagine the scope of future applications--even if you're one of the world's Internet gurus helping to bring it all about. Albright proceeds to describe the advanced services of "next-generation Internet," the "official, though generic, term used internationally by governments, educators and corporations to describe the future network and the initiatives under way to develop it." Going a step beyond application descriptions, Albright reveals who is developing what services and how the services were envisioned to be used. "The next-generation Internet will not come about as a wholesale replacement of current technology. Rather, it will emerge gradually as advanced technologies and applications become available and as applications that can exploit the service come to market." According to Albright, the next-generation Internet's advantages included broadband speed, video-rich media capability, and data storage and management. Working to bring about such advances were public and private agencies, as well as academic and corporate partners. Within a consortium called "Internet2" these organizations conducted "next-generation Internet" research. Projects in the prototype stage by IBM, for example, included file sharing and e(mail)-meeting applications that would become

possible when wireless networks upgraded to 3G technology, enabling wireless high-speed access to the Internet.

Acknowledging that the new applications and devices are “a wireless network operator’s third-generation dream,” Albright concludes that “with the world’s technology developers pursuing the goal, at least some of the envisioned services are likely to come true.” The discourse of the article anticipates the wireless world by sharing information and creating a common vision for stakeholders.

While technology design and application consumed much of the industry press, radio spectrum auction was arguably the highest-stakes industry topic. U.S. carriers needed additional radio spectrum to enable third-generation (3G) wireless technology. During the third phase, the FCC would auction spectrum to facilitate the availability of advanced wireless services and raise billions of dollars for the federal government at the same time. In the U.S., most spectrum bands have current users making the allocation/reallocation process politically and technologically complex. A typical industry article in Wireless Week (20 November 2000) on spectrum allocation, entitled “3G Interim Report Raises More Questions,” reported the status of events surrounding the issue. Much industry concern was centered on the timeline for spectrum

availability, as well as on which bands would be offered at the auction.

U.S. carriers were anxious to start offering high speed data services that were already available internationally. Recognizing the need to remain competitive internationally, as well as the potential for revenue from spectrum auctions, President Bill Clinton announced his intention in October 2000 to “facilitate advanced wireless services” by directing the FCC toward an aggressive timeline for holding auctions. Industry observers debated whether the FCC “would be able to meet the tight deadlines.” Those deadlines included identifying available bands by July 2001 and holding the auctions by September 2002.

According to author Allyson Vaughn, the interim report studied two frequency bands 1,755-1,850 MHz and 2,500-2,690 MHz and determined that “sharing spectrum is possible in the 1,755-1,850 MHz band but warrants further study” while spectrum in the 2,500-2,650 band would pose interference to satellite receivers such that it would be “very difficult to share in those bands.” The final report, due in March 2001, would further assess reallocation issues related to current users of the 1,755-1,850 bands, as well as cost issues to relocate existing users. “Despite government optimism for potential for spectrum sharing, 3G poses significant challenges because the radio waves are so

heavily encumbered. Whether the United States can stay competitive with other countries remains unknown." The process of rulemaking included opportunities for carriers and other industry players to weigh in on the high-stakes issue.

This type of article facilitates a discourse for solving national level regulatory and technical problems related to the wireless industry. The audience includes expert stakeholders in government and industry as well as an interested public. The discourse identifies barriers to overcome and processes to be implemented. It is a forum in which technology, economics and law eventually must rationalize a way to work together to solve a technical problem which affects hundreds of industry stakeholders and eventually the public at large.

In a third article titled "Glitzy Handsets Offer New Networks, Apps" (Wireless Week, 25 March 2002), writer Sue Marek offers her readers a snapshot of the latest wireless devices showcased at the 2002 CTIA Wireless Conference. The article was typical of industry pieces that capture the range of new features and functionality manufacturers display at annual trade shows. Describing the manufacturers as offering a "flurry" of new handsets and handheld PDAs in anticipation of the "growing convergence of wireless voice and data capabilities," Marek proclaimed that production of new cell phone products was moving

“full steam ahead” with cellular manufacturers “hoping the new devices … will attract new customers and help boost foundering wireless device sales.” Many of the phones displayed at the conference, according to Marek, had been built to work with multiple technology standards. In the race for the “hottest” new phone, Nokia led the others by introducing six new phones catering not only to the GSM carriers, but to CDMA carriers as well. Siemens, in a bid to enter the U.S. market, introduced a phone that combines multiple network technologies with high-speed data and Internet browsing features. The popularity of trade shows was in part due to the number of new products timed for release at such a show. At the annual CTIA Convention, the wireless future was not a dream; it was real. Trade show attendees were able to touch and feel the future of wireless right on the trade show floor.

In addition to serving as an information piece, this article illuminates the high-cost, high-stakes battle that manufacturers face in creating competitive advantage. The article works to reassure the industry that investment continues despite the recent market downturn in new customer growth. Marek caters to the industry insider with her frequent use of acronyms, such as GAIT, CDMA, TDMA, GSM, MMS (multi-media service) and GPS (global positioning satellite). Her descriptive

journey through the maze of new products creates for the reader a vision of unlimited potential. Many of the new phones would not last on the market more than a year if they made it there at all. However, the size and number of prototypes, as well as glitz and glamour of the trade show, highlighted the industry's continuing quest for smaller, faster cell phones and more, more, more applications.

Technology wasn't the only thing on manufacturers' minds as "customization and personalization appear[ed] to be key trends among device makers" as well. Instead of creating one phone to cater to the needs of all subscribers, device makers [were] designing their handsets to appeal to certain market segments, for example, Motorola's V70 "switchblade phone" featured a rotating cover and a circular display … targeted at the high-end fashion conscious subscriber." Marek's article was typical of post-trade show trade press in which discovery abounded and hype ruled. Following the conclusion of any industry trade show, industry writers detailed in dizzying terms the array of new products on the horizon. This type of trade article served to inform across sectors (i.e., carriers, manufacturers, government finance), as well as across industry competitors. It created a space for anticipating and channeling growth and competition.

The articles of phase three tell a story of an industry in rapid development, enumerating the good reasons for investing in an industry moving “full steam ahead” despite a financial market downturn and a national security crisis. While industry chronicled the advancements in products and service, advertising continued to tell consumers a story about price and value.

Public Advertising

Despite the stock market woes, carriers were determined to prove that new customers were plentiful. Public advertising was evolving toward a “multi-purpose” concept in which cell phones had the capability to serve individual needs: voice, data, Internet and, equally important, connections between family and friends. In phase three of the wireless revolution, advertisements continued to focus on the price and value concepts that were in widespread use during phase two. The value concept was expanded to include a new range of devices that could go to support and vary the uses of the cell phone. Value became a way to see the phone not as a single device, but something at the hub of additions and services that could be purchased.

Early in the phase, during 1999 and 2000, cell phone accessories (e.g., battery chargers, hands-free kits) were frequently highlighted in ads. However, the price/value concept remained predominant. Another continuing emphasis was on the family or share-plan offer.

In late 2002, Internet–capable phones and camera phones emerged as new advertising topics and a few carriers claimed to have the “best network.” These emerging topics are significant in that they represent the next stage of technology and capability in the wireless revolution, as well as a new effort by some carriers to differentiate themselves from competitors on topics other than price. Price remained a feature of all ads, however, as either a primary or secondary topic. Three advertisements are described below to illustrate typical themes of phase three advertising.

At the start of the new millennium, cellular phones benefited from network upgrades that allowed for faster data speeds. In November 2000, Sprint PCS introduced “the fully integrated phone and PDA by LG.” The headline grabber for this ad is “PRODUCTIVITY 2.” The ad size has grown to a full page and contains five main elements: the phone, the headline, two paragraphs of persuasive text, the Sprint name, logo, tag line and some fine print at the bottom of the ad. The core of the ad

is a photo of a device that resembles a personal digital assistant (PDA). The top section of the device is fitted with the familiar numerical key pad of a cell phone; however, the pad is raised slightly from the body of the unit, enticing the reader to peer beneath its cover. There, under the cover, is a flat surface resembling a monitor of some sort. A pencil-thin stylus about half the height of the device balances against its right side, poised for action. The Sprint name and logo appear on its lower half. To the left of the bottom corner are the words “Sprint PCS Wireless Web.”

The ad is clearly aimed at the business segment with “PRODUCTIVITY” as its headline and the phone as its centerpiece. There is no mention of price indicating that it is expensive. Digital technology has enabled advanced capabilities; however, consumers will need to pay for it. The persuasive text in the ad is reminiscent of the phase one ads as it trumpets the features of the phone: “There’s an enlarged 12-line high-resolution touch screen … a stylus built in and a speakerphone that allows for hands free operation. You can even check your corporate e-mail. … All of which gives you the freedom to conduct business from anywhere.” Once again the cell phone is the star--loaded with features enabling personal productivity and freedom, both of which are valued by the busy professional. These same concepts

launched cellular phones in the 1980s but with a very different phone. The key to productivity and freedom in the new millennium is Sprint's "all-digital, all-PCS nationwide network built from the ground up. …" The tagline makes the target clear: "The Sprint PCS Clear Wireless Workplace. Because business can't wait." Neither, apparently, can technology. The future is here.

Sprint. Advertisement. New York Times. 27 November 2000.

PRODUCTIVITY^2

Sprint PCS introduces the fully integrated phone and PDA by LG.

Multitasking has taken on an entirely new form. The Sprint PCS Phone™ by LG (model TP-3000) combines the benefits and clarity of a Sprint PCS Phone with the functionality of a PDA. There's an enlarged 12-line high-resolution touch screen with a full graphic menu, a stylus built in and a speakerphone that allows for hands-free operation. You can even check your corporate e-mail with one-touch access to the Sprint PCS Wireless Web for business. All of which gives you the freedom to conduct business from anywhere on our nationwide network with one very versatile device. In short, increasing productivity.

And, as always, you can count on crystal-clear calls, thanks to the only all-digital, all-PCS nationwide network built from the ground up, serving more than 300 major metropolitan areas and all major airports. To start making your business more productive, call 1-888-559-6950 or visit sprintpcs.com.

Sprint. **The Sprint PCS Clear Wireless Workplace.** Because business can't wait.™ **Sprint PCS**®

Local Sprint PCS Business Sales (212) 642-7116

The second ad appeared in the New York Times on October 9, 2003. It contains six key elements: a company name and logo; a large headline; a family image of a man, woman and child in bunny costumes; a short explanation of the offer next to this image; a small appeal for free phones with the advertised offer; and listings of store locations in New York, New Jersey and Connecticut at the bottom of the ad.

The core of the ad is the front-and-center, very simple, boldfaced headline: “Unlimited Family Calling.” After a large gap, beneath the headline is smaller text describing bonuses of the advertised family calling plan, complete with prices and “Unlimited Night and Weekend Minutes” and nationwide long distance included “Every minute, every day.” Next to this small set of information, the eye is drawn to a medium-sized picture of what appears to be a young family. The male figure/husband stands behind the female figure/wife, with his hand around her shoulder. She cradles a baby in her arms. All three wear full-body bunny costumes, possibly Halloween costumes since the ad appeared in an October issue. The only phone pictured in the ad is to the left of the family image, below the bonus features. A small cellular phone with the text “FREE PCS PHONE” on its screen is anchored by the bold text: “Up to five FREE phones.” The year 2003 was around the time in which the value of cellular

phone devices dropped dramatically and free devices were the norm. In small text beneath this image of the free phone is a warning: “Hurry, offer ends soon.” Directly below that is a Sprint’s “Satisfaction Guaranteed” text combined with a small outline of the United States. At the bottom of the ad, stretching across the entire length of the bottom of the page, Sprint store locations are listed in very small print. Beneath this is very small, difficult-to-read print that outlined the terms and conditions for the unlimited family calling offer being advertised.

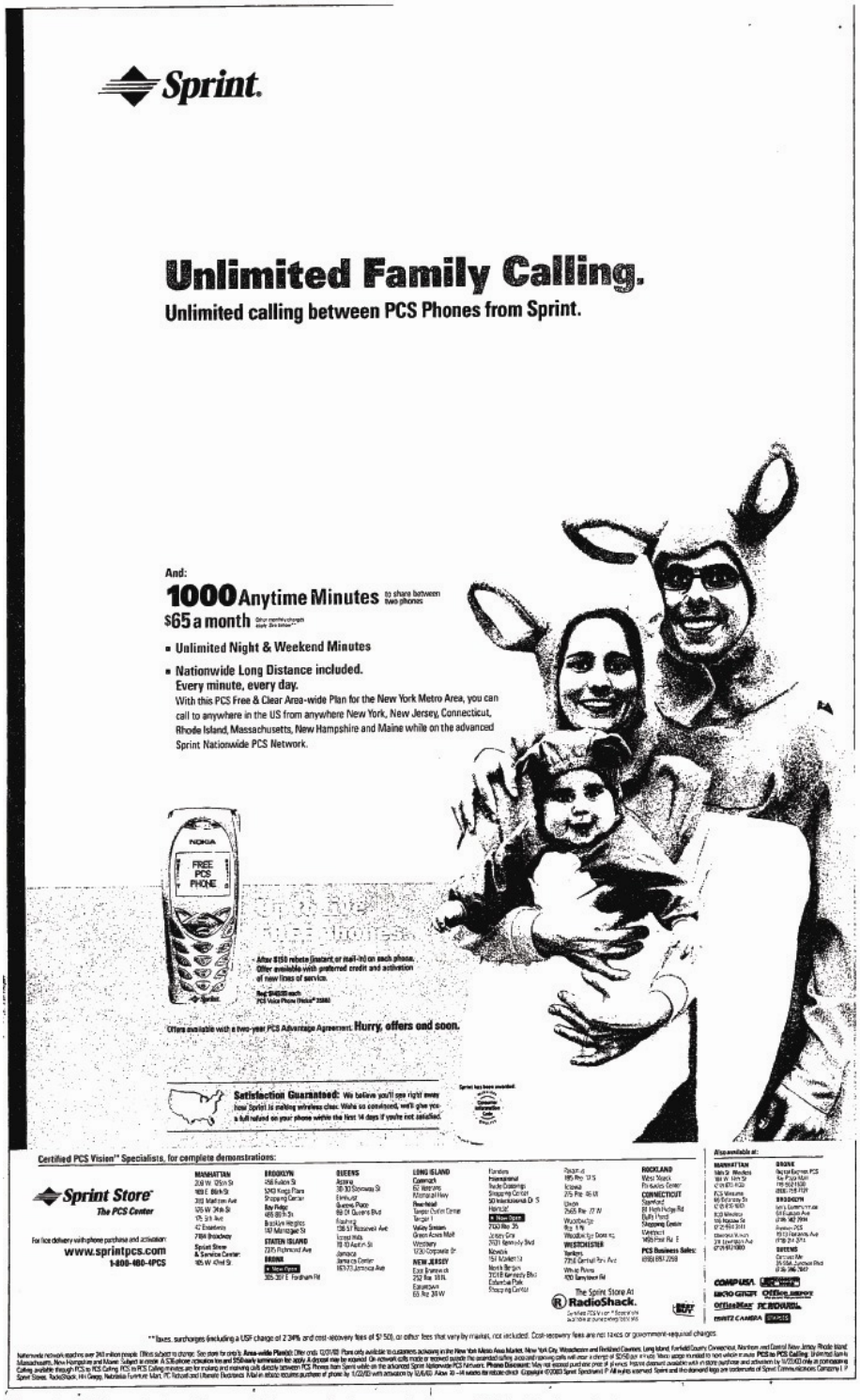
The ad is centered on two main features: the listing of the bonus features of the Unlimited Family Calling plan and the ad for up to five free phones. Each component was aligned in the center of the ad, whereas the picture of the family is off to the side. This suggests that the details given are of more importance than the visual family-image association. In a boldfaced type similar to that of the main headline is “1,000 Anytime Minutes,” followed by a price of “$65 a month.” Below this is a bulleted list of details of the plan’s features. The amount of information given about the details of the plan suggested an emphasis on pricing and the number and type of free or included items. An advertisement with this many pricing details suggested a sense of competition in the industry. The

focus here seemed to be on convincing the reader that Sprint was giving them the most for their money, whether the value was in free minutes, free long distance or free phones. Sprint presented itself as the best possible cellular service provider for the growing family. The catch, however, was that the "Unlimited calling" was good only on "PCS Phones from Sprint." This detail was stated directly beneath the large headline and next to the "1,000 Anytime Minutes." With the family share concept, it was Sprint's strategy and goal to increase customer volume.

The life world of the user was anticipated to favor savings and value. The purpose of staying in touch was personal. With "Satisfaction Guaranteed" listed next to an image of the United States, the ad played to a sense of traditional family values. With all of the detailed information the ad appealed to an informed user who was accustomed to evaluating cellular phones and price plans. The customer had a choice of locations in New York, New Jersey and Connecticut, as well as various retail stores that served as Sprint agents, such as Radio Shack, CompUSA, Office Depot, Office Max, Staples, Best Buy and Ritz Camera. The features of the cellular phone were not highlighted in the text. The main goal was to reassure the customer that the advertised price plan would provide the greatest value for the

family. The dominant message is “Unlimited Family Calling” and the star of the ad is the family. The phone is no longer a tool for business; it is an essential component of family life.

Sprint. Advertisement. New York Times. 9 October 2003.



If the family is the anchoring unit of use, the new phone culture also mirrors the diversity of its potential audiences. Cell phones are socially hip and financially smart. Advertisements reflect the growing diversity in American life as it spans a generation of immigrants, worlds of travel, and dispersions of families due to globalization in the workplace.

The third ad appeared in the New York Times, May 19, 2002. There are several key elements in what appears to be a full page ad: a large bold headline, a company name and logo, details of the plan incorporated into visuals of people using the service/cellular phone, an extensive list of stores and authorized dealers, and a decent-sized paragraph containing important information. The core of the ad is a large image, graphically divided into eight squares. Above this is this headline: “in mlife, NIGHTS AND WEEKENDS LAST FOREVER.” Four of the squares make up a picture of youthful people enjoying the cell phone. A white man laughs while talking on the phone, an Asian woman smiles while dialing a number and another woman with dark hair stands and gazes at a beach scene in the background. All three people could be in the same place and know each other or they could be in disconnected scenes, it is not clear; regardless, the image conveys a sense of satisfaction and relaxation. Moving clockwise to the block below the divided

image is a block dedicated to the Sony Ericsson R300. A small image of the phone appears to the left of a price listing for the phone at “$19.99” after a mail-in rebate. The savings from the rebate is detailed in a simple subtraction problem below the boldfaced “$19.99.” To the left of this is another block with the statement, “nationwide long distance included for life.” In a separate box just to the left of the previous is the brief fact, “400 anytime minutes for a month.” Upward from that is a black box with white letters, announcing “unlimited night and weekend minutes for life.” This box is a bit larger and spans the length of the two previously mentioned smaller boxes. Just above and to the right of this box we are back to the image of the three people, completing the square of boxes. Just to the left of this image is the statement, “AT&T Wireless Digital Advantage $39.99 monthly calling plan.” Below the graphics and bold-faced plan detail is the AT&T Wireless company logo and its slogan, “mLife is your life made truly mobile,” followed by the note, “AT&T Wireless ranked the #1 wireless carrier by Forbes magazine.” In a separate section below the AT&T signage is an extensive list of AT&T Wireless stores in New Jersey and New York, including addresses and store phone numbers. Below this is a separate section of AT&T Wireless authorized dealers in the New York area. Finally, in the last section of the ad at the

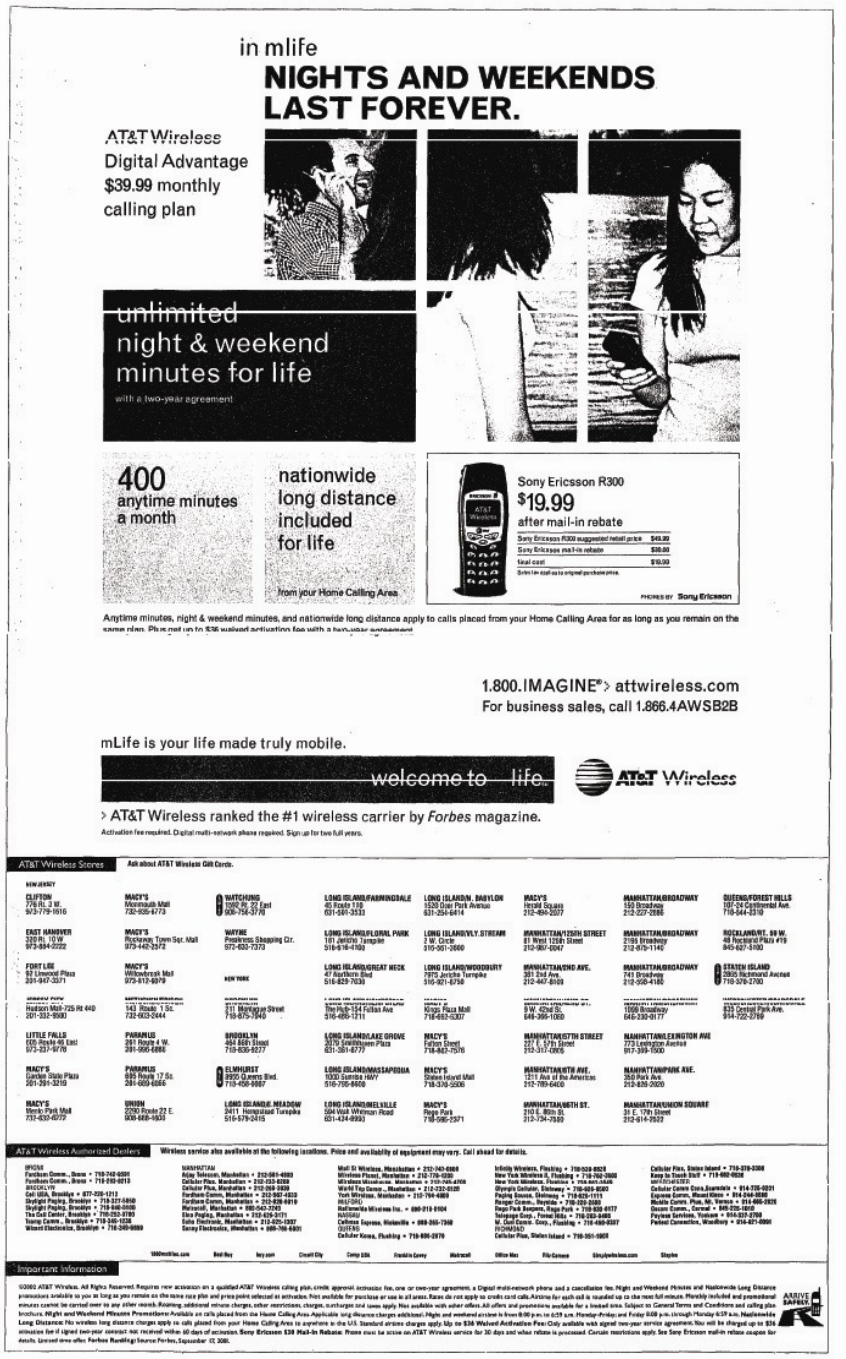
very bottom of the page is a section entitled “Important Information” that lists details and conditions of the advertised offer in the smallest print on the page.

It is unclear what “mLife” refers to but it seems intended for the 18-34 young urban professional demographic. The bold headline “NIGHTS AND WEEKENDS LAST FOREVER” seems to be AT&T’s attempt to be edgy and attract the age demographic of people who go out at night and on the weekends. With details about pricing and features that are free or unlimited surrounding the image of the youthful people with their cell phones, it is implied that these sorts of details are what attract young people to the service. Free minutes and unrestricted long distance are perhaps more important than the phone itself. The list of locations and phone numbers for AT&T service makes it easy for the reader to act and pursue the advertised offer.

The life world of the user is anticipated to favor fun and value. The prospective new user is drawn in by the possibility of nights and weekends lasting forever if they use “mLife” service. Terms and conditions that apply are clearly listed in the ad and therefore convey a sense of security that AT&T is not trying to hide anything from their customers. The ad appeals to the readers’ desire to get the most value for their money.

The features of the phone are not prominent; the emphasis is on the details and advantages of the “mLife” plan. The star of the ad is the lifestyle that this service plan can offer. The life of fun and leisure in which nights and weekends never end is the desired state and the purported effect of using this plan. AT&T promises to transform lives by making everything cheaper and easier with unlimited minutes “for life.”

AT&T. Advertisement. New York Times. 19 May 2002.



Consumer advertising in phase three had everyone “covered” from the business professional seeking the latest Sprint “productivity” phone to family value plans and “mLife” for young adults. Advertising continued to place major emphasis on the low cost of a wireless phone. The safety theme played a continuing role via family and other low cost plans. During 2001 and 2002, family share plans were a dominant advertising theme, perhaps due to higher public safety awareness following September 11th. However, because the national economy was still in a recession during that time, carriers were competing for market share; the low cost promotion was used consistently as a tool to gain market share.

Chapter Summary

The main topics of phase three that reveal themselves across the categories of public and industry press are recession and reinvention. The wireless industry, after its decade of double-digit growth in new cell phone users, began to face the realization that customer growth was slowing relative to prior years. While the recessionary economy no doubt contributed to slower customer growth, the industry had achieved a penetration level of more than 50% and rapid growth beyond that point would

be more difficult to achieve. Carriers needed to find alternative sources of revenue and simultaneously reduce costs. Profit pressures, combined with the need to compete on a larger national scale, generated ongoing speculation about potential mergers within the industry; indeed, consolidation was occurring. For example, Bell South Mobility and Southwestern Bell Mobile Systems merged to form Cingular Wireless. Consolidation events such as these allowed carriers to demonstrate to wary investors that they were strengthening their competitive positions and pursuing greater economy of scale in their operating structures.

The public press was dominated by three themes: safety, etiquette and entertainment. Safety issues were important in both industry and public press, but from different perspectives. The public press focused mostly on stories of driver distraction when using cell phones, usually citing tragic accidents, while the industry press focused on advanced technology required to enhance cellular 911 and location services. Consumer advertising continued its focus on low cost plans in an effort to gain market share amidst intense competition.

While voice customer growth was slowing in phase three, multi-media applications, data services and wireless Internet had barely begun to penetrate the market. Phones were changing

shape; form depended on application. QWERTY keyboards accompanied numerical dial tone pads. Pictures, e-mail, Internet, music, video, news and entertainment—all were now available on a wireless phone. These services would change the cellular wireless world as it had been known for more than two decades. The twenty-first century wireless world would be vastly different. Poised on the edge of convergence, the wireless industry prepared for its future.

Chapter Five

Conclusions and Further Explorations

Rhetoric and the Wireless Revolution: 1983-2003

The final chapter begins by drawing on the discursive form of narrative in the wireless revolution to support the four initial premises or theses that began the readings of the wireless revolution. The narrative features of three rhetorical sites, along with an identification of topics, good reasons and the modes of proof, will yield clues about how discourse functions to create a technology revolution. For Aristotle (1954), to understand the power of rhetoric, the discourse characterizing the subject matters of areas of public discussion must be known:

> The duty of rhetoric is to deal with such matters as we deliberate upon without arts or systems to guide us … Most of the things about which we make decisions, and into which therefore we inquire, present us with alternative possibilities. [1357a]

This dissertation has taken as its subject matter one crucial modern public topic of discussion, wireless communication. The inquiry engaged in rhetorical criticism of key documents embedded within successive stages of the wireless revolution.

The documents taken together form a narrative which connects past to present as a matter of discussion, difference and development.

The greater the change in expectations, the greater the anticipation and confirmation of change, the more revolutionary a sequence of narratives becomes. Wireless communication has been a sustained topic of public discussion through the last twenty-four years. Through critical analysis of three sources of rhetoric--industry magazines, mainstream press and advertising--this study has revealed common lines of argument used frequently to form stock issues (or core themes) in a communication revolution. These issues include (1) questions of technological determination advanced by industry spokespersons who weigh the means and ends of development in relation to issues of cost, feasibility and resources; (2) questions of judgment put forward by the public press whose interests are in evaluating the good and bad points of cell phone use; and (3) questions of desire put forward by advertising to motivate even greater use by exciting the imagination. This dissertation argues that the communication revolution was not initiated by a single point of view, but by an entwining braid of multiple engaged resources within three rhetorical sites for explication, reflection, anticipation and persuasion.

The first site, industry press, reflects the standpoints of the industry as its internal organs discussed technical issues that covered the science of communication related to radio spectrum, network technology, regulation and economics. The second site, public news articles, reflects how the press fulfilled the role of informing the public from an objective standpoint, which meant balancing good and bad points for the new technology from a variety of dimensions, including most prominently safety and security. Finally, a third site featuring consumer advertisements envisioned audiences and adapted appeals to expanding audiences as the dissemination of new technologies constituting the revolution unfolded.

Conclusions on the Theses

The four initial theses or premises that began the study were supported in the readings of the wireless revolution. These were:

1. Communication revolutions have characteristics that entwine scientific, technological, market driven, political and social change.
2. A communication revolution is driven by topics, lines of argument and <u>good reasons</u> where the nature

of what is acceptable in the use, spread and choice of technologies changes over time.

3. A communication revolution is marked by periods, or phases, with more or less distinctive topics that are articulated by different combinations of ethos, pathos and logos.
4. The rhetorical discourse of a technology revolution operates with strategies to propel the technology forward, despite known or unknown risks, using persuasive tactics to legitimize the scope and pace of social change.

First Thesis: Communication Revolutions

The first thesis is supported by the overlapping and reciprocating concerns that show up throughout the periods of the study through the variety of rhetorical sites. While each site had a different take on the matter, the periods were characterized by a confluence of the new technology, its spread to markets and the way the discourse in each period fulfilled past ambitions and anticipated further developments. In other words, the complex array of technical, social, stylistic and cultural discourses centered the revolution in relatively

distinct moments in time. Over the study period of twenty years, three phases emerged. Phase one dealt generally with the launch of cell phones across the U.S. from 1983-89; a time when cellular telephones become a reality for the public. Phase two included the years 1990-1998 and formed a middle period characterized by rapid growth in systems and customers; the cell phone was in revolutionary triumph during these years. Phase three encompassed the final four years of the study time period, 1999-2003, and had two major and distinct elements: slowdown and reinvention. As the narratives were analyzed, certain aspects of revolutionary change were revealed, with the situated audiences of each site constituting reasons for engaging in the revolution. The following paragraphs provide an overview of the narrative findings across the three sites and three phases. The findings support the first thesis that communication revolutions have characteristics that entwine scientific, technological, market-driven, political and social change.

In the first phase, cellular radio as a technology was a revolutionary concept but the social and cultural implications were not yet fully apparent. Cellular telephone numbers were not attached to a person; they were attached to a cellular telephone installed in a mobile vehicle, such as an automobile. While the science of cellular radio was revolutionary, the social and

stylistic aspect of the cellular car phone was not; the car telephone was bulky and heavy compared to today's sleek models. Its usefulness was limited to a narrow segment of the population that could afford it--the upscale, white collar professional or the small business owner/entrepreneur.

The advent of the portable cellular phone in the late 1980s ushered in a completely different paradigm for personal, mobile communication. With a portable phone, the phone number was associated with the person--not a physical place or an object. As industry pushed for favorable regulatory decisions and technology standards, the mainstream press educated the public on the one hand and sent early messages of concern on the other. Advertising concentrated on the cellular phone itself in an effort to educate and persuade early adopters that the technology worked and, despite its steep price, was an essential tool for productivity. While the narratives within each site are uniquely tailored to their respective audiences, there is overlap in the sense that the major themes across the sites involve education, technical exploration and visioning of the future of wireless.

While in the first phase the topics and themes in the three sites studied had similarities, in the second phase (1990-98), the rhetorical emphasis of the sites would diverge: Cellular

technology would struggle to keep up with customer demand, resulting in technical problems such as static and dropped calls, and the industry would face a public health crisis that threatened to halt its course.

In phase two, social and cultural acceptance of cellular phones occurred faster than industry anticipated. Capacity was strained on analog networks, causing industry and government to scramble for solutions. Industry pushed for new digital technology standards while government rushed to release additional radio spectrum and award new licenses. The public press consumed itself with the most serious controversy the wireless industry would face: Did cellular phones, held against the head for voice communication, cause brain cancer? While mainstream press reported extensively on the known facts, it turned out that the most important information was unknown and likely never would be known. Consumer advertising played to mainstream concerns of price and function; for a time, free phones prevailed. The technology spread to new demographics by the end of the phase, attracting entire families and especially the teen segment. In this middle phase, the sites of discourse were noted more for their difference in topics than similarity and this would continue as the industry matured.

In the third phase, years 1999-2003, cell phone penetration climbed to 50 percent of the U.S. population, not a saturation point based on levels seen in Finland and Sweden, but higher than the most optimistic U.S. analysts' forecasts. Digital phone technology had substantially decreased the size of portable cell phones and new digital networks had eased the capacity problems of major cities. Industry pushed for more radio spectrum; it still needed to serve the other 50 percent of the population. Mainstream press weighed in on etiquette topics and safety issues, as well as the future of wireless Internet and entertainment. Advertising concentrated on lifestyle and entertainment topics; there was a phone for every age, style and purpose. As cell phones permeated modern social life, the race continued for the smallest, fastest, most feature-laden phone. Despite a recession, a major terrorist attack and unanswered questions on health and safety, the wireless revolution pushed on through a slower growth phase with new inventions igniting old passions for growth and profit. The euphoria of ever-expanding personal communication options had trumped wireless anxieties, allowing the revolution to continue, albeit in a new form. Across two decades, the combined narratives of multiple discursive sites reflected science, technology, politics, economics and social change, constituting a discursive structure

of time periods and rhetorical sites in which the remaining three theses will be supported.

Second Thesis: Topics and Good Reasons

The second thesis is that a communication revolution is driven by topics and good reasons where the nature of what is acceptable in the use, spread and choice of technologies changes over time. Inside industry, the logic was a matter of scientific measure, regulatory development and the appeal of anticipated technology. Throughout the industry's first two decades, the thrill of new beginnings was balanced by the risk of unknowns. Unknown risks included the pace and success of technology and market development. Industry discourse highlighted the positives: growth, profit and jobs, reflecting good and worthwhile reasons for participation. For the wired telephone companies, cellular participation meant survival in the long run. For the early entrepreneurs, it meant potential wealth. The federal government saw wireless licenses as a money machine, issuing licenses through an auction process that eventually generated more than $20 billion dollars, with more to come. Investors anticipated growth and profit. As the digital picture became clearer, industry could see new potential for wireless

services--services that would compete with computers and PDAs. The good reasons within industry's narratives were not lacking.

The mainstream press dutifully noted the industry's good reasons for participation as it reported extensively on cellular developments while balancing concerns with social responsibility; it both promoted and restrained the industry. The press educated, warned of risks and generally reflected the pleasures, fears and needs of the public. The press also deliberated the technology's disadvantages: topics of privacy, health and safety were prominent. The advantages were even more plentiful, however, and the narratives reflected this. There were new features and phone applications, expanding market segments, and exciting developments in digital technology to address. In contrast to the insider focus of the industry texts, the public press provided an opportunity through its editorials for the public's point of view to be heard. The public who opposed technology's intrusions into daily life was represented as well as those who promoted the technology's merits. The press found that wireless was a treasure trove of good and bad reasons.

Advertising's topics appeared to follow and anticipate the market. The advertisements promoted the virtues of belonging to the wireless world: status, money and power. As numbers expanded

and varieties changed, so did the nature of the represented attractions. In the early years of the revolution, the consumer ad focused on the phone. When competition forced carriers to lower prices and differentiate themselves to the public, value-pricing schemes became advertising's dominant feature. As digital technology allowed the phone to become smaller, lighter and loaded with advanced features, the new advantages plus affordability enticed additional market segments. These advantages of wireless were evident. There were drawbacks to a constant-contact world, but these were overshadowed by the positives. The good reasons trumped the bad, with each site deploying the lines of argument that worked within and for its situated audience.

Third Thesis: Ethos, Pathos, Logos

The third thesis is that the combination of ethos, pathos and logos created a distinctive feature of the revolution. Over time, the definitions of these terms have varied. In the modern world, the terms take on special meaning when telling the story of new communication technologies' potential and limits, attractions and repulsions, virtues and vices. In this study, when ethos was examined, I looked at how the character of the

human use of new technologies was defined as a matter of social standing or as a matter of propriety, that is, proper use. According to Corbett, “The ethical appeal is especially important in rhetorical discourse, because here we deal with matter about which absolute certainty is impossible and opinions divided” (80). The mainstream press constituted a certain character for wireless technology in its choice of stories and its attempt to balance the good with the bad. In these stories, the press revealed the good reasons for participating in the wireless revolution balanced by the revolution’s anxieties, annoyances and fears. Ethos surrounding the early cell phone adopter suggested a progressive, important, savvy and successful user. However, the press was obliged to report the bad with the good, as it did with articles such as “Use of Phones Held Car Safety Factor,” which revealed early concerns about the potential link between cell phone use and car accidents. The debate expanded over the next decade, fueling critics of cell phones to question the public use and especially the personal judgment and priorities of the average cell phone user. The character of the cell phone user came under fire: “A useless phone call killed my child,” a Missouri mother said of a 1997 car accident in which a distracted cell phone user crashed into her daughter’s car, killing her (Cline 1). Critics speculated

that “the cell phone scourge would soon reach the stage that smoking reached a few years ago… [with] smokers … skulk[ing] around in alleyways and under stairways when they’re trying to sneak a puff” (Campbell 29A). Initially portraying prestige and power, the cell phone user’s character and social standing is questioned as mass market usage brings new issues to the forefront.

As cell phone users multiplied in later phases of the revolution, they interrupted, annoyed and, worse, created dangerous public situations. The cell phone user was everywhere, annoying some and angering others as personal conversations appeared to take on more importance than public decency, safety and respect. The ethos of the cell phone user was thus challenged in important ways. Despite these developments, cell phones were and continue to be a metaphor for an imagined world of novel connections, portraying safety, security and a new brand of personal connectedness. The industry had anticipated and delivered an undeniable status for the user. Carrying a phone demonstrated belonging and importance to someone, not necessarily to something. The expanded demographics and purpose enabled the press to continue its enthusiasm for the industry despite the problems. In effect, “the whole discourse of the press continued to maintain the ‘image’ that the speaker or

writer sought to establish" in the early years (Corbett 82). Expansion of the product line seemed to solidify an established and predominantly positive cell phone ethos even as the product matured and public fault lines appeared. Phones reflected their owners' needs, uses and personal tastes. Like clothing and hair style, phones became a personal accessory. No longer was the character contained in the device itself; it was an extension of the user's character, judgment and style. While cell phones acted as extensions of their owners' characters, consumer advertising played to the emotions of users, existing and new.

Pathos distills the motivations for entering a world in which new values are attached to communications. According to Corbett, "It is argument (the appeal to understanding) that produces conviction about the conduciveness of the means to the desired end; it is the appeal to the emotions that makes the end seem desirable" (87). The motivational appeals to cell phone users evolved with changing audiences over time; for the meaning of terms such as mobility, productivity and connectedness changed with the stylistic representations of technology as the technology itself was altered and as the market mandated new or varied motivational appeals to be successful. Consumer advertising played to the emotions and motivations of cell phone users. In phase one, users wanted the phone because it signified

prestige and power. In phases two and three, as competition intensified and prices fell, fast increasing market penetration levels anticipated expanded demographics, and carriers advertised accordingly: a pregnant woman, a traveler with car trouble, a teenager who desires “unlimited nights and weekends.” In each case, the ad was designed to play on the emotions of a diverse, expanded audience with whom prestige and status prevailed--while fear, coolness and fun were added as relevant appeals for successful marketing. Users enjoyed options; the cell phone was personal and held individual meaning and emotional attachment. Digital technology had brought a bounty of new services to a public increasingly amenable to blending work, family and play in a wireless world. As Corbett explains, “… the emotional appeal plays a ‘vital part in the persuasive process’” as it “conjure[s] up the scene or situation or person that will make people experience the emotions” (94). For more than two decades, consumer advertising presented the varied scenes and situations in which users could be persuaded that cell phones were desired, if not essential, to life.

While advertising played to emotions and the blending of work and play, the industry carried forth on the basis of rational appeals, or logos. Jasinski writes:

> As a mode of proof, logos is understood as rational argument or appeals based on reason as opposed to appeals to the emotions or to the character of the speaker or writer. … [Logos] could refer to both language or discursive practice and the intellectual capacity or power to formulate ideas linguistically and employ language as a means to an end. (350)

The industry stories portrayed in the study period establish the advantages of wireless technology by linking means to ends in an efficient way. The question of functionality sometimes centers on the strength and limits of the technology, sometimes on the system of delivery; but the guiding values of efficiency, progress, access and robust reliability constitute the world of practical reason for becoming a member of the new age. The early logic that built the industry was centered on the promise of a technology that aided communication in a productivity sense and the anticipation of favorable regulatory decisions. The industry identified barriers (i.e., the need for more spectrum and more efficient technology) and pushed for technological breakthroughs, such as multi-mode handsets and smaller batteries. Information was shared across the field and across competitors to solve problems, identify shared resources and move the business forward. Collectively, the trade press and its

choice of topics conveyed a wealth of insider knowledge, to and for insiders, which helped to normalize the business while anticipating and channeling its growth. Industry press focused consistently on three major issues throughout the study period: regulatory rules governing licenses and spectrum, national technology standards, and new technology developments and products. The discourse of the industry press worked to “make clear to others what is advantageous, just and good” (Rahe qtd in Jasinski 351). On balance, the industry press resounded with positive good reasons; not one article representing disaster or despair was uncovered. Even with the recession and other disadvantages of the third period, the industry appeared to be moving along as well, perhaps better and faster, in the new millennium as it had in the two decades before. The combination of ethos, pathos and logos thus combined to create a cell phone culture that today is pervasive in modern life.

Fourth Thesis: Revolution and Social Change

The fourth thesis is that the rhetorical discourse of the revolution operates to propel the technology forward, in spite of the unknowns, using persuasive tactics to legitimize the scope and pace of social change. We found three unknowns in our

reading: social acceptability, physical risk and market viability. Social acceptability seemed the least resistant. Cell phones evolved to meet needs just as fast as technology advances could permit. Even when the cell phone was ugly, it was novel and desirable. When cell phones were considered a potential health risk, consumers kept buying. When cell phones didn't work well because networks were congested, consumers complained but kept buying. When cell phones added cameras and color screens, music and videos, customers bought them regardless of whether these features were used. Therefore, social acceptance was quick and users were resilient when problems appeared; but concerns remained, especially in health and safety.

Physical risk of harm from cell phone radiation was and remains important; but without concrete evidence, there is no impact. In Cellular Phones, Public Fears, and a Culture of Precaution, Adam Burgess states:

> None of the studies made public so far has offered verifiable evidence of negative health effects from cell phone emissions. It is potential rather than actual harm that has prompted concern. … The heart of the cell phone matter, like so many other contemporary risk issues, is that we, and the manufacturers, cannot rule out the possibility of future harm. (2-5)

The concerns of researchers, including the former industry head of research, George Carlo, were based largely on the possibility of harm, not on actual evidence of harm. Thus, physical risk remains an unknown but is contained by absence of evidence.

The third unknown involved market viability. The wireless financial market was vulnerable, especially during the economic downturn in the third phase, but it too seemed resilient. To some extent, the discourse of the revolution had a level of hype that created a bandwagon effect. In part, the revolution was based on speculations that were taken as the future. Fortunately for the industry, consumer growth was far more rapid than forecasted. The hype turned out to be reality more often than not. When, beginning in the mid-1990s, wireless companies began to merge and smaller companies were acquired to gain economies of scale and geographic scope, the changing landscape encouraged investors to keep their money in wireless. Ric Prentiss explained it this way:

> When we deal with the financial community, they're looking for disruptive change. Something that comes in and massively changes the landscape, and can be very quick about it. … As we sit here today, in 2003, the [next] revolution/evolution is really the [wireless] data one. We're just on the cusp … it too will

probably have to have that revolutionary/evolutionary type of status.

As long as investors buy into the hype and the industry delivers on it, wireless investment will continue.

Despite risk and dramatic societal changes, the wireless revolution pushes forward. Current authors provide insight to the phenomenon of communication technology's seemingly unending growth and change. According to Mitchell Stevens, "the history of two earlier 'communications revolutions' [the inventions of writing and the letter press] provides a number of lessons …" (9):

(1) It takes a long time to realize the potential of a new form of communications – much longer than those who are living through these changes expect.

(2) In their early stages, which tend to last centuries, new forms of communication are reduced primarily to imitating older forms of communication.

(3) All new forms of communications are attacked during these centuries-long early stages.

(4) These "communications revolutions" may not be bloody but the changes they cause can be far-reaching and frightening. … New forms of

> communication can remake the way we look at the world. … (9-10)

These lessons would seem to apply to the many kinds of revolutions described by Beniger, not only to the communication revolution. Yet cell phones are one of the few innovations in recent history to reach more than 70 percent penetration levels in less than twenty-five years. The speed with which the public adopted and embraced the change afforded by personal mobility, on its own terms, is remarkable. Communication scholar Manuel Castells studies the effects of communication and mobility on everyday life. In Mobile Communication and Society, Castells, Fernandez-Ardevol, Qui, and Sey discuss the social impact:

> … The emergence of a given pattern of social transformation can be observed across cultures and contexts, not only in the U.S. but globally. We can say that mobile communication is, throughout the whole world, a pervasive means of communication, mediating social practice in all spheres of human life. But it is adopted, adapted, and modified by people to fit their own practices, according to their needs, values, interests and desires. People shape communication technology, rather than the other way around. (125)

Agreeing in principal that people shape technology, James Katz, in Machines That Become Us, examines how personal technologies are assimilated into people's "lives, bodies and homes" and argues that machines "do indeed become us" in that they "serve both function and fashion purposes" (317-319). It seems that while technology helps to shape communication, people help to shape technology.

Overall Conclusions

In summary, then, it seems cell phone culture is not a given, nor can it be explained by a theory; rather, it points to self-constituting features. The revolution has self-constituted through a range of emotions and the way the market was interpreted either through hype or debate. The cell phone culture thus reflects our own character, logic and emotions. The technology is shaped for people by people through rational appeals; in Castell's words, "to fit their own practices, according to their needs, values, interests and desires" (125). The combinations of ethos, pathos and logos found in the different sites thus created and nurtured a distinctive signature of the wireless revolution. The writings of Castells et al. and Katz support the notion that cell phone culture

cannot be explained by one theory or another. Rather, the discursive practices of the revolution point to self-constituting features found in the various rhetorical sites and manifested in the public over time.

Through analysis of the narratives in the multiple sites, we have understood the story of this technology more completely. That the sites hold different topics, controversies and important moments is not surprising since each site has a different audience. The arguments and good reasons within each site reflected the values of each situated audience and spoke to particular questions of the revolution from that point of view. Each site identified and deployed its own persuasive discourse, identifying what was advantageous, good or virtuous about the use, spread and choice of wireless technology.

Industry discourse pushed the good reasons for participation, emphasizing that which was advantageous, expedient and useful for the revolution-makers to succeed. Public discourse revealed not only the advantages but the disadvantages of wireless, such as health and safety risks, loss of privacy, and interruptions. The press enabled some degree of judgment to occur; wireless had its pros and cons after all. Advertising naturally focused on the advantageous and useful characteristics of the wireless phone. This site used discursive

and non-discursive discourse to celebrate the virtues of wireless mobility.

Within the sites was evidence of the classical modes of rhetorical proof, each mode seeming to occupy a particular rhetorical site: industry favored logos as it strove to normalize the business; mainstream press developed an ethos for wireless by relating the good and bad uses, actions and outcomes; and consumer advertising played the pathos card by inciting emotions to push forward the sales.

When the narratives are taken together as a discursive structure, we see that the communication revolution was not initiated by a single point of view. The rhetoric surrounding cell phone technology braided persuasive lines of argument and an ethos, pathos and logos that were uniquely situated within a particular discourse site. The revolution appears to be constituted, not constructed nor determined, by the rhetorical mass that surrounds the artifact itself. Industry held perhaps the most “technologically deterministic” rhetoric. Advertisers used motivation and various imaginative elements to persuade, while the mainstream press offered at least some modification and judgment to the seemingly unstoppable path of the technology’s progress. The lines of argument and the persuasive

topics changed over time as evidenced within the phases of the technology's start-up, growth and maturity.

The dissertation thus concludes that technology development and social change are mutually constitutive. Wireless technology was propelled by a multitude of persuasive tactics within various rhetorical sites. The result was a revolutionary discourse that seemed to point the technology in one direction--forward--but the lines of argument within the sites were and are diverse. There is not one discourse that propels this technology; rather, there are multiple strands. In the case of wireless technology, the strands of discourse were swept together at given moments in successive stages to create the revolution. The revolutionary discourse of the wireless revolution is thus revealed as a controversy that swells with importance as the use of wireless is anticipated, cascades, and finally becomes embedded in ordinary life.

Further Explorations: Twenty-First Century Wireless

The discursive structure that results from the narratives of the three sites forms a complex baseline for assessing and understanding the continuing consequences, offshoots and developments of the revolution. To some extent, the wireless

industry had a discourse structure in which the good reasons for participation and the parameters of advocacy were set by the revolutionaries themselves. The structure remained throughout the twenty-year period despite technology limitations, health and safety issues, market risk and price/cost concerns that increased with the pressures of success. The conclusions of the study raise several questions for further exploration.

First, how might our findings generalize for other communication or information technology revolutions? Looking backward, we can see several possibilities for analysis, the most obvious being the computer and Internet revolutions. The computer revolution's persuasive logic probably included productivity in the early stage, utility in the middle stage and some degree of entertainment in the third. The Internet is possibly in its middle phase, with availability dependent on market factors and widespread use presently dependent on at least some measure of a user's technical skills. Narrative analysis of the rhetorical sites that constitute the computer and Internet revolutions could reveal key topics, arguments and reasons, perhaps forming phases similar to wireless. Comparing the rhetorical similarities and differences of multiple technology revolutions could further develop a theory of discourse formation during a new technology's commercialization,

as well as contribute to understanding situated audiences, particularly those embracing new media.

The audience for a technology revolution doesn't happen by accident; it is to some degree developed by the revolution makers and their situated audiences, as we have seen in this study. "Audience making" is a related term in communication studies and is illustrated by Marsha Siefert's account of the phonograph's early market commercialization. In "The Audience at Home: The Early Recording Industry and the Marketing of Musical Taste," Siefert revealed how advertising and marketing materials introducing the Victor Talking Machine Company in the beginning of the nineteenth century created an "audience at home" for the phonograph. The talking machine had been marketed as a musical "innovation," which allowed it to enter an existing market for pianos and other instruments. The same home audience would later embrace the early introduction of radio (187-190).

Siefert's example supports the findings in the wireless revolution. The audience for a new technology not only is situated; it is conditioned by the use of prior products. The premise would seem to affect the delivery strategy and pace of acceptance for new technologies in countries in which no prior audience conditioning exists. For example, cell phone use is not generally preceded by use of a landline phone in remote areas of

Africa. The African audience is different, of course; this would invite an analysis of rhetorical difference in discourse practice, in addition to attempts to replicate the findings of the present inquiry.

Future studies could look forward in time as well. We could endeavor to understand more about future direction of the Internet, computers and wireless by continuing to analyze the discourse surrounding the artifact as the revolution continues to unfold. Our observations likely will change as time passes. It is conceivable that analysis of discourse as “language in action” will anticipate new revolutions in the building phase. For example, cell phones in some parts of Asia allow users to connect everyday objects with the Internet simply by pointing the phone’s camera at an object to read its coded information. The code translates into a “physical hyperlink,” which connects the phone’s Internet function to a Web site that displays more information about the object, or simply saves the data for later review (Story 1). A study of the cell phone’s discursive formation in Asian countries where the device is popular might be able to help anticipate the timing and acceptability of the service here in the U.S. The findings from this and other studies also could anticipate and influence cell phone development in developing countries.

Wireless executive Kari-Pekka Wilsa, President of Nokia, Inc.’s cellular handset manufacturing business, was asked in 2003 what the wireless future held. He predicted the next phase quite accurately:

> We are getting used to having the Internet content at home and in the office. People want to have that Internet when they’re mobile. … The industry needs to develop the technologies which will enable this Internet experience … so the next big revolution is when [the industry] can do the same things for the Internet as we did for the voice.

In the intervening years between 2003 and 2007, wireless carriers did in fact begin to offer Internet mobility and content that, especially with the recent introduction of the “iPhone,” replicates important aspects of the computer screen Internet experience. Using high speed 3G networks, carriers now offer mobile access to the Internet for e-mail and surfing, Bluetooth-based technologies for hands-free voice calling, real-time news and live video. To be sure, some of the controversies of the 1980s and 1990s haven’t gone away. Sherrill Sellman writes:

> Each and every one of us must proceed with caution when entering the Wireless Zone. … Although the

> Wireless Industry and some governmental agencies continue to assure the public of the safety of cell phones … the truth is that … Cell phones are anything but safe and harmless.

Sellman then cites George Carlo, former head of the wireless industry's research effort, as being "… very concerned about a looming health epidemic … by 2010, if some kind of intervention is not affected, we anticipate a half million cases of eye and brain cancers directly attributable to these devices" (Carlo qtd. in Sellman 55). While cancer stories continue to surface occasionally, the topic does not generate the same degree of public scrutiny as cell phones and driver safety.

Citing studies that demonstrate a link between using cell phones and car accidents, lawmakers have acted in a number of states and local municipalities to legislate the use of cell phones in cars. Recently, in Illinois, teen driver laws were overhauled for the entire state, barring teen drivers from using a cell phone in the car until age nineteen (Gregory 3). This followed the passage of a law in Chicago that requires all drivers to use a hands-free system when making cellular phone calls. Another topic that continues to capture the public's ire is the cell phone excise tax. Taxes have always been a source of public frustration; cell phone excise taxes are as high as 21.1

percent of the monthly bill in some states (Silver B1). While local governments tackle driver safety and tax matters, the federal government anticipates collecting revenue from another source.

The FCC is preparing for a third round of spectrum auctions in early 2008, this time in the 700 MHz band, to enable another bounty of advanced wireless services. Declaring that one third of the newly available spectrum will be subject to “open access” rules and anticipating $10 to $15 billion in revenues from the auction (“FCC backs” 1), potential licensees are preparing their strategies. This time, the bidders will extend well beyond the traditional telecom carriers and cable companies; Google and a wide array of Internet entrepreneurs are expected to participate. The Internet companies are no longer content on their own turf; wireless spectrum will open future possibilities for those outside of radio, telecom and cable.

The wireless industry continues to push forward with one successful handset innovation after another. The latest wireless product sensation is the “iPhone” developed by Apple, Inc. and sold exclusively for use on AT&T’s wireless network. Selling for a robust price, this phone, with its clean lines and simple touch-screen, is poised to redefine cell phones once again: “[Industry] analysts can generally agree on one thing: the sleek

touch-screen iPhone will change what consumers expect from the mobile phones offered by wireless companies" (Richtel B1). The cell phone is reinvented in the new millennium as simply wireless; it's not just a phone anymore. Information and communication technologies overlap; wireless mimics the capabilities of the computer and computers become wireless phones.

Communication continues to evolve with new possibilities. This point brings forth a final, important question: How does the analysis of the wireless revolution continue? The idea of convergence seems to make it a stream that now flows into other worlds. The legal, political and economic issues have remained but on a more incremental basis. Cell phones have become a discourse structure whose parameters of advocacy were set by the revolution. Wheeler talks about the future:

> I think the revolution continues and it now becomes a revolution of--what does this new paradigm enable? The Internet enabled a whole series of new applications from Amazon to Facebook but it still followed the old model-—you had to go to the computer to get the information. Wireless broke the paradigm that had existed since the caveman … in that suddenly information is coming to the consumer rather than the

> consumer going to the information, and that--I call a revolution.

With information so accessible, how does the wireless revolution proceed within institutions, into the world of work and play, and across the globe? We address each in turn before closing.

Significant changes are occurring in institutional practices such as marketing, education and the workplace. Workplace culture has changed in that the norm is now to infuse its connections everywhere. In “The New Techno Culture in the Workplace and at Home,” Richard Gendreau discusses technophobia, information overload, multitasking paradox, uninvited e-mail and “technostress,” which is “a person’s reaction to technology and how the pervasive influence of technology … invades the workplace and home at every level. … Juggling technology like cell phones, pages, and electronic conferencing has all the ingredients for a technology meltdown. … One can easily forget that communication is about relationships, not technology” (191). Not everyone suffers from negative consequences; some people embrace communication technology almost as an addiction.

In a Chicago Tribune article, Leslie Mann interviews technology “addict” Alan Wagner, who admits his attraction to his BlackBerry device is such that “even in the middle of the night, I check my e-mail messages … I get so many e-mails every

day, that it is more stressful for me to ignore them and for them to stack up than for me to keep up with them" (1). The effect of being in constant contact is only one element of where the revolution is headed. New marketing practices will soon find their way into wireless as well. According to Catherine Holahan:

> Marketers are taking tools that they already use to track your Internet surfing and are preparing to combine that information with cell-phone customer data that include not just the area where you live but also the street you're standing on. The aim is to target the exact person who is most likely to buy a product at the precise moment they're most likely to buy it. … Campaigns that combine Web data with location information to target ads from nearby businesses to individuals [via cell phone] are just a couple of years away. … (1-2)

While the advertising industry may applaud this news, privacy advocates view the "combination of behavioral and geographic targeting [as] an Orwellian nightmare" (1). Again the revolution fuels controversy between old and new ways. Marketing is not the only institution affected by wireless.

Education is finding new ways to incorporate wireless, although at a somewhat slower pace. According to Ronald Roach,

"Higher education IT experts tend to view the last 20 years as a period divided between the pre-Internet years … and the Internet age, which … facilitate[d] convenient Internet access and the networked campus collaboration among people based at multiple institutions. [Information and communication technology innovations have] permeated throughout colleges and universities from administrative systems to the research laboratories to classrooms and student life" (92). But our lives are not entirely consumed with work and education. The wireless revolution invades the entertainment world as well.

As if video games, You Tube and live sports videos did not provide enough entertainment, users soon will be able to read books wirelessly. Technology company VOCEL and romance publisher Harlequin are launching their own wireless revolution. The companies have joined together to launch "Harlequin On the Go, a mobile application aimed at women that offers a variety of entertainment choices including daily installments of serialized novel by best-selling authors. Harlequin novel fans will be able to download a chapter a day" (Mullen 8).

While the U.S. is moving full steam ahead with many new innovations, it is not the most advanced country as far as mobile innovation. Louise Story writes in the New York Times about the "new Web world" in Japan. There users can point their

phones at objects and advertisements to receive detailed information. The most promising way to link cell phones with physical objects is a new generation of bar codes: square-shaped mosaics of black and white boxes that can hold much more information than traditional bar codes. The cameras on cell phones scan the codes, and the codes are translated into videos, music or text on the phone screens. As with text messaging and Web surfing, however, the cell phone user may need to get used to the idea. “The consumer needs a reason to do it,” said Jim Levinger, chief executive of Nextcode, a bar code company. “They don’t just wake up and say, ‘Hey let’s go scan some bar codes’” (Levinger qtd. in Story 16). Adopting wireless seems easy in Japan, the U.S. and other advanced countries; other countries may not have the same means or abilities. Going global raises more questions for the wireless revolution. Looking five years out, Wickham forecasts a completely different wireless industry:

> We’ve achieved penetration rates here, and around the globe, that has people thinking that their communication world is wireless. I think there will be a quantum leap when the people growing up with wireless start their careers. I suspect that this industry is going to look completely different five years from now.

This inquiry has articulated a discourse structure for the wireless revolution in the U.S. Does the revolution follow the same phases and have the same characteristics in other modern societies? Equally, if not more important, do revolutions have peculiar qualities or characteristics in developing societies? The outcomes are far from predicable, but no doubt the interest for mobile phones is strong. According to iSuppli Corporation executive Dale Ford, vice president of market intelligence, “The level of penetration globally for wireless communications is astounding. … Nothing, except for electrical power, comes close” (Ford qtd. in Kataria 24). The growth is “posing both challenges and opportunities” as mobile phone makers strive to understand the market and deliver phones to meet needs. “The number of world wide subscribers for wireless-communications services is expected to increase to 4 billion by 2010, up from 2.6 billion in 2006. … New subscribers in developing nations are largely responsible for this growth. Key regions, including Africa, the Middle East and India, are deriving this growth” (Kataria 24). Both network manufacturers and handset companies are interested in participating in the global wireless revolution. Partially due to the absence of landline telephones, great strides are being made in developing countries with “ultralow-cost” cell phone handsets. “For India, low-end phones will drive the next

phase of growth," said Jagdish Rebello, Ph.D., director and principal analyst for iSuppli, predicting that "ultralow-cost handsets will rise to account for more than 9 percent of total mobile-phone units produced in 2010, up from less than 1 percent in 2006" (Rebello qtd. in Kataria 24). While the global future of Africa and India by these selected articles seems wireless-bound, is the change a revolutionary one? Interestingly, the terms found in the global wireless discourse reviewed tend to be the same ones found in the U.S. discourse, for example: growth, change and revolution.

There is a certain degree of global hype; the bandwagon effect exists here, as well. Some products will make it and some will not; but the speculations for growth will fuel innovation in the third world countries much as it did in developed nations. The institutional, educational and global impact of the wireless revolution is yet to be fully understood because the wireless revolution is constantly evolving. Within the broad confines of the modern communication revolution, even the definition of communication continues to evolve. Within this changing and expanding understanding, another word appears with increasing frequency: convergence.

The word convergence, like communication, technology and revolution, resists definition, yet in closing the term must be

addressed. What is convergence? Henry Jenkins, author of Convergence Culture: Where Old and New Media Collide argues that convergence represents a cultural shift:

> … Convergence should [not] be understood primarily as technological process bringing together multiple media functions within the same devices. Instead, convergence represents a cultural shift as consumers are encouraged to seek out new information and make connections among dispersed media content. … Convergence does not occur through media appliances, however sophisticated they may become. Convergence occurs within the brains of individual consumer and through their social interactions with others. (3)

According to Drucker, however, the term convergence means something different inside industry: "… in the world of wireless telecommunications [convergence] seems to be akin to the holy grail. … The term "convergence" is being applied to many different trends" including wireline-wireless integration, voice and data system mergers, telephone/entertainment combinations, and various other technological devices and enablers (25).

Convergence is occurring despite the fact that we cannot consistently define it. One positive outcome may be that "convergence culture is enabling new forms of participation and

collaboration …" (Jenkins 245). Perhaps convergence is simply another metaphor for change, a term for dealing with new phenomena that defy simple definition in the present time. Essentially, our world is becoming hybridized, with text, oral and visual communication styles blending to become a simultaneous activity, forming new subcultures for language. For example, wireless manufacturers in Europe are developing television for mobiles while phone operators work to develop VoIP (Voice over Internet Protocol) for the mobile Web. Italy has offered commercial broadcast mobile TV services based on DVB-H (one of several broadcasting standards) for more than a year (Blau 36).

The future of communication technology cannot be predicted, only anticipated. "Now [that] general mobile ubiquity is upon us, the focus is on choice, preference and user experience. We all demand different things from our mobile devices. … It's worth remembering that mobile is the sixth medium (after print, radio, TV, recorded media and the Internet) and the fourth screen (after cinema, TV and PC)" (Short 15). Within the various technology revolutions under way, including information, computer, Internet and wireless, prior experiences shape the technologies that become part of our present and future behavior. "Wireless communication technology does have powerful

social effects by generalizing and furthering the networking logic that defines human experience in our time" (Castells et al. 258). Technology and communication will continue to evolve and will remain an influential part of our lives. As Katz points out, our "machines" are what we make of them:

> Machines will always be servants of humans, representing them in far-distant places, remote time and dangerous locations. … And they will always be a part of who we are and what we communicate to others. … But even after the many ways of "becoming" that have been explored here, it is, at the end of the road, still us. (318-19)

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