Paradoxes of Technology: Consumer Cognizance, Emotions, and Coping Strategies

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DAVID GLEN MICK
SUSAN FOURNIER *

Although technological products are unavoidable in contemporary life, studies focusing on them in the consumer behavior field have been few and narrow. In this article, we investigate consumers' perspectives, meanings, and experiences in relation to a range of technological products, emphasizing lengthy and repeated interviews with 29 households, including a set of first-time owners. We draw on literatures spanning from technology, paradox, and postmodernism to clinical and social psychology, and combine them with data collection and analysis in the spirit of grounded theory. The outcome is a new conceptual framework on the paradoxes of technological products and their influences on emotional reactions and behavioral coping strategies. We discuss the findings in terms of implications for theories of technology, innovation diffusion, and human coping, and an expanded role for the paradox construct in consumer research.

No one eludes technology—the telephone, the computer, the airplane over head, the air-conditioned air. Technoculture is irrefutable and pervasive (Postman 1992). One leading view, called the substantive theory (Feenberg 1991), contends that technology is a power in its own right, fundamental to the historical trajectory of Western civilization. Without it, "contemporary culture—work, art, science, and education, indeed the entire range of interactions—is unthinkable" (Aronowitz 1994, p. 22). Hence, technology has become not only necessary but also "inconspicuous" (Borgmann 1984, p. 3), if not "invisible" (Druckrey 1994, p. 11).

Such profundities have a distinctly ironic character in relation to the field of consumer behavior, where studies of technology have been limited in number and focus. Most work has emphasized the antecedents, rates, and act of technology adoption (see, e.g., Gatignon and Robertson 1985; Oropesa 1993). By comparison, only a minuscule amount of research has been devoted to consumer behavior *after* technology has been acquired (about 0.2 percent of studies within the diffusion-of-innovations paradigm; Rogers 1995). Television and computer products account for the bulk of consumer technology research (e.g., Hoffman and Novak 1996; McQuarrie and Iwamoto 1990; Reeves and Nass 1996; Thompson 1994; Venkatesh and Vitalari 1987; Winick 1988). Most other consumer technologies have been overlooked, perhaps because they are assumed to be comparatively less significant. The main exception has been feminist-historical studies of household technologies (see, e.g., Cowan 1983), but these studies are retrospectively based on archival data, not on the experiences of living consumers.

Consequently, we embarked on a multimethod, multiproduct inquiry of consumer technologies in everyday life (see Mick and Fournier [1995] for full details). This article reports on selected data sets, emphasizing the lengthy and repeated phenomenological interviews we conducted to uncover the perspectives, meanings, and behaviors that our informants brought to bear in buying and owning technology. The result is a new conceptual framework that emerged from literature and data in the spirit of grounded theory (Strauss and Corbin 1990), synthesizing the concepts of paradox, emotions, and coping strategies within the domain of technological consumer products.

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In the following section, we selectively review literature on technology, paradox, and postmodernity. These ideas are then interwoven with insights from psychological research on emotional responses to paradox and coping mechanisms for stress. Next, we turn to our methods and findings. In the discussion section, we draw out the implications of our work for the substantive theory of technology, the diffusion-of-innovations paradigm, and research on human coping. We close by recommending an expanded role for the paradox construct in future consumer research.

CONCEPTUAL BACKGROUND

Technology in Western History and American Society

The term ''technology'' can encompass both material and nonmaterial things (e.g., laws). In a narrower sense, and the focal definition in this article, technology ''refers to artificial things, and more particularly modern machines: artificial things that (a) require engineering knowledge for their design and production, and (b) perform large amounts of operations by themselves'' (Joerges 1988, p. 221).

Humans have had a fascination and complex relationship with technology since the dawn of their existence (Ferkiss 1969). Writings on technology extend back to Aristotle, increasing with the expansion of science and capitalism during the industrial development period that began in the late seventeenth century (Ellul 1964; Mumford 1966). Science and technology have been pivotal to Western societies ever since. During the last 150 years the modern period has been characterized by a surge of technology to unprecedented levels of performance and sophistication (e.g., medicine, transportation, communications). Indeed, the word that may best define modernism is ''progress'' (Brown 1995).

Historically, the United States proved to be fertile ground for the growth of technology, in large part because American inventors and capitalists (e.g., Bell, Edison, Ford) seized the financial opportunities of new technological products and the American public tended to link newness with improvement (Postman 1992). Today, Americans seem more fixated on technology than any other culture (Ferkiss 1969). At the same time, the transformation of American life into a fully engulfed technoculture of tools, machinery, and networks is quickening (Joerges 1988; Postman 1992). Hill (1988) has noted that as technology diffuses into numerous spheres of life, its meanings come about from its alignment with the myths and mores of society. In the United States the positive meanings of technology continue to center around liberty, control, and efficiency (Boorstin 1978), which represent core American values identified by Tocqueville over 150 years ago ([1835] 1954).

Postmodernity and Paradox

Modernism's faith in progress through science has faded in recent decades (Feenberg 1991; Tenner 1997). The pace, complexity, and unintended consequences of our scientific times have played major roles in fermenting a postmodern age in which the human condition is characterized, in large part, by paradoxes (Brown 1995; Firat and Venkatesh 1995; Handy 1995). We now find ourselves ''in an environment that promises adventure, power, joy, growth, transformation of ourselves and our world—and, at the same time that threatens to destroy everything we are'' (Berman 1983, p. 15).

Notwithstanding, the origins and importance of paradox were established by philosophers in antiquity (e.g., Zeno, Plato). From the logician's viewpoint, a paradox is a statement that appears self-contradictory, though possibly well founded or essentially valid (Quine 1966). It is epitomized by the famous Liar Paradox: ''What I am now saying is false.'' If true, it is false; if false, it is true.

Although the paradox concept has been elaborated in different ways over the years, particularly outside the field of formal logic, it has always centered around the idea that polar opposite conditions can simultaneously exist, or at least can be potentiated, in the same thing. While seemingly mere intellectual gymnastics, to grapple with paradoxes is in fact to come to grips with fundamental issues. Kant, for example, maintained that contrary opinions were a primary property of human thought, whereas Hegel argued that paradoxes were actually intrinsic qualities of nature that were mirrored in the human mind (Nuckolls 1996). Paradox and its twin concept, dialectic, also play leading parts in treatises by prominent historians, sociologists, and psychologists (e.g., Durkheim, Freud, Marx, Thoreau). More recently, the paradox concept has provided refreshing theoretical value on several disparate topics, including gender (Lorber 1994), leisure (Coalter 1989), and health care (Gregg 1995). In consumer research, however, it has been relatively scarce. For example, Mick and Buhl (1992) founded their model of advertising response on consumers' dialectical life themes, and Thompson and Haytko (1997) developed new insights on the use and disuse of fashion based on dialectical social tensions.

The Paradoxes of Technology

The literature on technology is vast, and, as a result, perspectives vary on a number of dimensions. On one opinion authors unite: technology has been elemental to both modernity and postmodernity. Some, nonetheless, view technology strictly in laudatory terms. They argue that technology provides freedom, control, and efficiencies in time and labor, to the extent that twentieth-century consumers have appropriated at their fingertips the deific qualities of omniscience, omnipresence, and omnipotence (see, e.g., Asbell 1963; Canham 1950). Alternatively, some perceive technology darkly (see, e.g., Ellul 1964;

Glendinning 1990; Hill 1988). They argue that technology degrades the environment, usurps human competence, encourages human dependence and passivity, and puts all species on the brink of obliteration.

In contrast to pure polemics, some observers have argued that technology itself is paradoxical. For example, Winner (1994) claims that the same technology that creates radiant feelings of intelligence and efficacy can also precipitate feelings of stupidity and ineptitude. Goodman (1988) notes how appliances purchased for saving time regularly end up wasting time. Also, Boorstin (1978) maintains that technology assimilates people as well as isolates them. For related discussions, see Pacey (1983) and Segal (1994). Unfortunately, none of these arguments about technology paradoxes has been corroborated or modified by consumer data.

It is important to emphasize that the concept of paradox is not simply a relabeling of the cost-benefit equation that has dominated psychology and consumer research, including prior work on innovations (Lowrey 1991; Rogers 1995). Typically, costs and benefits are qualitatively distinct issues. For example, it might be said that the main costs of exercise are expensive equipment, time commitments, and occasional injuries, whereas the main benefits appear to be weight control, lower blood pressure, and improved self-esteem. Moreover, it is assumed that these costs and benefits are generally known beforehand and remain relatively stable over time.

Alternatively, a paradox maintains that something is *both X and not-X at the same time.* Moreover, pure and fixed equilibrium between the polar opposites is not achievable (Handy 1995; Nuckolls 1996). Thus, when something is paradoxical, the saliences of the antithetical conditions are likely to constantly shift, probably due to situational factors, evoking the sensation of a teeter-totter, bobbing up and down between contrary feelings or opinions. For illustration, consider again the topic of exercise and, more particularly, vigorously sustained aerobic exercise (e.g., long-distance running, cycling, or swimming). One could argue that such strenuous exercise is at least partly paradoxical, both strengthening the body (e.g., heart and lung functioning) and weakening it (e.g., by straining joints, ligaments, and muscles). In general, unlike cost-benefit analysis, the paradox perspective highlights the friction, indeterminacy, and required vigilance that accompany ongoing activities or interactions with anything in daily life that harbors a paradoxical nature.

No one as yet has codified the paradoxes discussed across the technology literature. One of our emergent goals was to accomplish this task as a necessary step to investigating consumers' cognizance and experience of key technology paradoxes. On the basis of extensive review, we noted over 20 paradoxes. However, some inconsistencies that were called paradoxes (e.g., of the form ''technology does X, but it also does Y'') did not fit the stricter and more philosophically accurate conceptualization that we adopted (technology is/does both X and not-X). Other paradoxes were oriented toward macrosocial

issues, rather than personal everyday existence. Ultimately, we focused on eight paradoxes (see Table 1). As it is apparent in the following discussion, although paradoxes can apply to different levels of consumer technologies (e.g., a widely defined product class such as telecommunications or a product feature such as digital recording), in most of our cases they apply to the holistic experience of a particular product per se (e.g., a telephone answering machine).

Psychological and Behavioral Responses to Technology Paradoxes

Early analytical psychologists theorized the mind as a nexus of overlapping tendencies of approach and avoidance toward one or more objects (see, e.g., Bleuler [1911] 1950; Freud 1938). They were pioneers in elaborating the mental force of paradox and its proximate outcomes of conflict and ambivalence. More recently, Weigart and Franks (1989) and Goldman (1989) have argued that the contradictions of postmodern technological societies have created a widespread temperament of conflict and ambivalence. Often faced with simultaneously opposing consequences, today's consumers of technology vacillate in a perceptual space of yes/no that never settles (see, e.g., Gregg 1995).

As also discussed by Bleuler, Freud, Weigart and Franks, and others, the conflict and ambivalence precipitated by paradoxes lead, in turn, to anxiety and stress. The clash and doubt associated with inevasible opposite states is upsetting, if not traumatic. In the technology literature, anxiety and stress have been commonly mentioned as psychological reactions to technology (see, e.g., Cowan 1983; LaPorte and Metlay 1975), but theoretical connections to paradoxes, conflict, and ambivalence have been nebulous (however, see Rosen and Weil's [1997] recent advances).

Research on people's responses to the major anxieties and stresses of life (e.g., divorce) has flourished in recent years (see, e.g., Carver, Scheier, and Weintraub 1989; Lazarus and Folkman 1984). Stress-management theory has focused on developing taxonomies of coping mechanisms and relating these to antecedents (personal and contextual) and consequences (psychological adjustment). Coping mechanisms have been categorized as avoidance or confrontative, and further subcategorized as psychological or behavioral (Holahan and Moos 1987). One common finding has been that confrontative mechanisms (e.g., negotiation) lead to better adjustment than avoidance mechanisms (e.g., resignation).

Structural Framework Linking Technology Paradoxes and Consumer Coping Strategies

On the basis of the premise that the paradoxes of contemporary life are endemic and irresolvable, Handy (1995) argues that the only viable response is to accept them and attempt to cope. As yet, however, the paradoxes

TABLE 1

EIGHT CENTRAL PARADOXES OF TECHNOLOGICAL PRODUCTS

Paradox	Description
Control/chaos	Technology can facilitate regulation or order, and technology can lead to upheaval or disorder
Freedom/enslavement	Technology can facilitate independence or fewer restrictions, and technology can lead to dependence or more restrictions
New/obsolete	New technologies provide the user with the most recently developed benefits of scientific knowledge, and new technologies are already or soon to be outmoded as they reach the marketplace
Competence/incompetence	Technology can facilitate feelings of intelligence or efficacy, and technology can lead to feelings of ignorance or ineptitude
Efficiency/inefficiency	Technology can facilitate less effort or time spent in certain activities, and technology can lead to more effort or time in certain activities
Fulfills/creates needs	Technology can facilitate the fulfillment of needs or desires, and technology can lead to the development or awareness of needs or desires previously unrealized
Assimilation/isolation	Technology can facilitate human togetherness, and technology can lead to human separation
Engaging/disengaging	Technology can facilitate involvement, flow, or activity, and technology can lead to disconnection, disruption, or passivity

FIGURE 1

STRUCTURAL FRAMEWORK OF THE SOCIOHISTORY OF TECHNOLOGY PARADOXES
AND CONSUMER COPING STRATEGIES IN DAILY LIFE
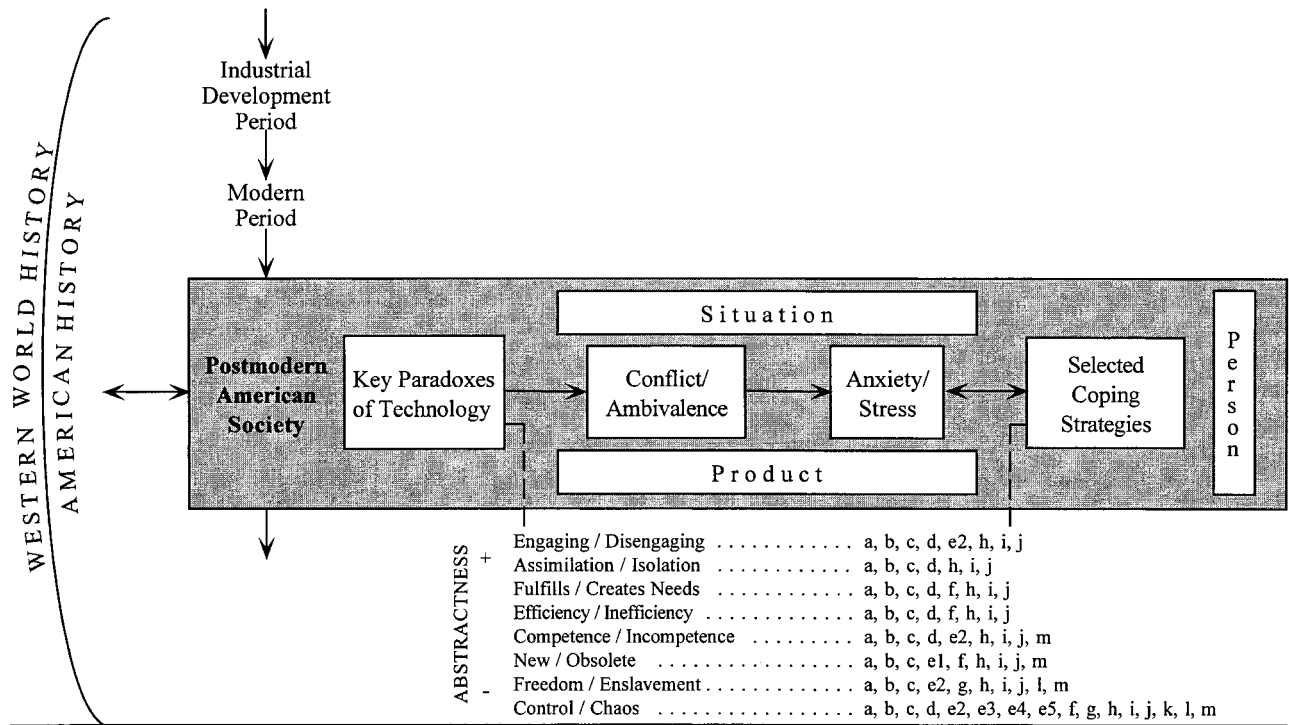
NOTE.—Pre-acquisition avoidance strategies: (a) ignore, (b) refuse, (c) delay. Pre-acquisition confrontative strategies: (d) pretest; (e) buying heuristics: (e1) latest model, (e2) basic model, (e3) expensive model, (e4) familiar brand, (e5) reliable brand; (f) extended decision making; (g) extended warranty/maintenance contract. Consumption avoidance strategies: (h) neglect, (i) abandonment, (j) distancing. Consumption confrontative strategies: (k) accommodation, (l) partnering, (m) mastering.

of technology have not been linked to specific consumer coping strategies. Figure 1 represents our effort to frame these issues graphically. It emerged from a cyclical process of reading literature and collecting and interpreting data. We introduce the framework here, before presenting our data, because it serves not only as a consolidation of the literature reviewed above but also as an advanced organizer for the discussion that follows.

Figure 1 incorporates the eight key paradoxes of technology from Table 1 and suggests further that they vary

from the fairly concrete to the relatively abstract. The former are widely experienced and most easily articulated by consumers (control/chaos, freedom/enslavement, new/obsolete), whereas the latter are more subtle and more difficult to express (assimilation/isolation, engaging/disengaging). Prior theory and research also suggest that technology paradoxes are likely to provoke conflict and ambivalence that stimulate anxiety and stress, which then prompt coping strategies. The two-way arrow between stress and coping strategies indicates the intended reciprocal effect of strategies lowering stress (though they may not always do so). The coping strategies we focused on at this stage in our research are behavioral rather than psychological (discussed later as future research). The coping strategies were classified as either avoidance or confrontative, and further subcategorized according to the stages of pre-acquisition or consumption. As Figure 1 suggests, some coping strategies relate to all eight paradoxes whereas others are associated with only a subset of paradoxes. In addition, it is important to recognize that the entire process ensues as a function of several other factors. Notably, the type of product, situation, or person involved may moderate which paradoxes are salient, the degrees of conflict and stress experienced, and/or the coping strategies undertaken.

METHODOLOGY

Data Collection

Shortly after library work began, we conducted pilot research through four depth interviews and a focus group with a convenience sample of adult volunteers from a local charitable organization (in exchange for a donation). The purpose was to initiate us to consumers' terminology and perspectives on the meanings of ''technology'' and related products. At the same time, we started a dyadic memo-writing process to register literature reviews, data analyses, and potential paths to future investigations (eventually totaling over 125 memos).

Soon afterward, we fielded a mail survey to a convenience sample of middle-aged adults from local communities ($n = 89$, ages 25–45, 37 males), recruited by marketing research students as part of their course requirements. The questionnaire consisted of sentence completions and an imaginary dream-telling exercise, which, as projective techniques, are useful for studying hidden and sensitive topics. They served as a methodological complement to prior structured surveys on technology and to the more direct questioning approaches we used in subsequent interviews.

The richest data came from the phenomenological interviews, averaging 90 minutes each, that we conducted in natural settings of product ownership and use. Two samples (i.e., interview sets) were involved, for a total of 29 households (35 consumers). Informants' ages ranged from 20 to 79, the gender split was approximately even, and their occupations and activities were quite varied (e.g., college student, nurse, chemist, upholsterer, artist, retired sailor). Most were Caucasian, occupying the middle or upper middle class of local society. In retrospect, the upscale bias in the samples was deemed valuable because the results related to ignoring, refusing, or delaying strategies are unlikely due to financial constraints as compared to the factors that we emphasize (e.g., motivations for managing technology paradoxes).

One interview set, a cross-sectional inquiry, consisted of two long interviews each with 16 informants who were casual acquaintances of the researchers. The goal of the first interview was to gain insights into how the specific informant defined and perceived technology generally. We conducted the second interview closely following the principles of phenomenological psychology (cf. Thompson and Haytko 1997), starting with the open-ended prompt, ''Tell me about a technological product you own that you would like to talk about.'' We then probed for description and elaboration on the basis of the informant's own words.

The second interview set, consisting of longitudinal data, was collected from 13 individuals or families intercepted at electronics stores as they were purchasing for themselves a technological product they had not previously owned. Products were selectively chosen to vary in complexity as well as their stage in the product life cycle or diffusion curve (telephone answering machines, portable computers, video cameras, and caller-identification devices). Informants were interviewed at home within 24 hours of purchase, six to eight weeks after the purchase, and again six to eight months after the purchase. This panel of informants provided the opportunity to examine more closely the acquisition process and the evolution of consumers' perspectives and behaviors toward their new technological possessions.

Data Analysis

We analyzed the sentence-completion data through standard content analysis, developing coding categories and then training two graduate students to independently code the responses. Coding agreements were acceptable (80–95 percent range), with disagreements resolved through discussion.

The dream tellings and interviews were analyzed through a modified constant comparative technique (Strauss and Corbin 1990). Analysis of the interview data took place during and after data collection, to take advantage of opportunities to follow up on insights before interviewing was completed and to draw insights from the entire corpus of data. The technology paradoxes from prior literature served as a priori codes, with specific coping strategies as emergent codes. Connections between these first-stage codings were explored independently by each researcher (called axial coding), and then a joint meeting was held to discuss and improve the axial codings accordingly. Next, each researcher wrote memos reflecting his or her holistic interpretation of the separate

cases and then distributed the memos to the other researcher. At a subsequent meeting, final refinements to each ''story line'' (Strauss and Corbin 1990) were made by iterating between the two memos and pertinent case data. The researchers then wrote concluding memos as summary documents about the outcomes of discussing each case. This overall process provided a rigorous assessment and consolidation of codings, in pursuit of thick interpretations grounded in histories, contexts, and interactions (Denzin 1989). It also facilitated triangulation across informants and researchers to elevate the trustworthiness of the findings.

FINDINGS

Corresponding to Figure 1, we organize our findings into two major sections: (1) consumer cognizance and experience of technology paradoxes and (2) associated coping strategies. In each section, insights are drawn from across the data sets.

Cognizance and Experience of Technology Paradoxes

General References. Sentence completions in the survey revealed cursory evidence of consumer sensitivity to the paradoxes of technology. For example, one sentence stem read ''I would describe technological products as . . .'' While the modal response category (24 percent) was efficiency (e.g., ''getting the job done quicker''), 16 percent of the responses were classified in a contradictions category, which explicitly revealed consumers' recognition of the dialectical character of technology, including such replies as ''helpful and hurtful,'' ''double-edged sword,'' and ''a blessing and a curse.'' Another sentence stem read ''If I were ship-wrecked on a secluded island and had to live without technological products. . . .'' A mixed reaction was provided by 8 percent of the respondents, showing again straightforward appreciation for technology's Jekyll-Hyde qualities (e.g., ''My life would be less complicated, but I would have more physical work to do''). Some interview informants used similar glosses such as ''mixed blessing,'' ''double-edged sword,'' and ''catch-22.''

Control/Chaos and Freedom/Enslavement. These two paradoxes often appeared together and were among the most salient across all data sets and informants. From computers to washing machines, technological products are often positioned as facilitating control and freedom of activities. Yet these same technologies can also breed the opposite conditions of upheaval and dependency. Thompson (1994) noted these two paradoxes in his case study on the purchase of a computer printer.

The opposing elements of these paradoxes were vividly detailed in the dream episodes (note that the survey respondents rarely mentioned both sides of a paradox because they were randomly assigned, or in one condition

they naturally chose, to imagine a positive or negative dream; see Mick and Fournier [1995] for details). For example, a 45-year-old male created the following dream episode concerning his desire for increasingly sophisticated telecommunication and transportation technologies to allow him to travel by car ''hands free'' (perhaps to complete other work) and to reduce the pressures and risks associated with an urban environment:

> Through telephone cable I can dial any number in the world and communicate instantly. My dream would be to have a metal cable built in every road constructed in this country. When leaving for work I would dial the location I am going to on a special sensor in my car. Leaving my driveway I would position my car over the cable until the sensor ''connection'' was made; at that time it would be possible to commute hands free in my personal vehicle to work. The car would be propelled toward my destination safely through all intersections. The sensor signal would never allow two units in the same space at the same time. When arriving at my destination I would be warned by signal that I should take control for final parking at the location of my choice off the highway!

In another dream, a laptop computer wakes its owner, tells him his daily schedule, beams his toiletries over, and selects a suit from the closet. As he summarized, the computer ''comes with me everywhere and has planned my every move.'' These positive dreams suggested that technology can direct human affairs and destiny perhaps better than humans can do themselves.

Among the nightmare dreams that were constructed, the majority evoked the terrorful side of the control/chaos paradox. For example:

> The nightmare began right in my own backyard. I woke up bright and early to tackle the lawn. I brought my newer lawn mower to the shop weeks ago. It still wasn't ready, so seeing as the grass was about three feet high, I was forced to dig up my old mower, which had been rusting and rotting for what seemed like forever. As I opened the shed, there it was, alone in the corner. I pulled it out, wiped the dirt from its brow, fed it some gas, and pulled the cord. Nothing. Again I pulled, still nothing. After the third try, I hauled back with all my might and kicked the machine as hard as I could. It rose up with a fury. I could see what looked like a menacing grimace on its face. I thought it was my imagination. But I broke and ran anyway. It chased me all over the street, up and down yards, devouring everything in its path. I looked back. It was right on my heels. Neighbors watched and laughed. I kept running, kept screaming. I felt my legs begin to get weak. It was gaining on me. Then, just as it hurled toward me, it let out a roar . . . ''NOT!'' (Female, age 40)

Common to these nightmares, technological products are endowed with occult powers that serve an unmistakable vengeance usually attributed to abandonment, misuse, or overuse. A recurrent theme in these ordeals is a consumption reversal reflecting a primal fear of being devoured by technological products (other examples included a photocopy machine sucking in and transposing the opera-

tor to paper and a garbage disposal yanking an artist's hand into its reeling blades). In these cases, technologies used for controlling activities reveal their own willful personalities—provoking chaos.

The paradoxes of control/chaos and freedom/enslavement were also manifest in the phenomenological interviews. For instance, one of the informants (Bonita), who had an aversion to talking on the telephone, reluctantly purchased a telephone answering machine after substantial pressure from her friends, who claimed they could not easily reach her. Midway through the first interview, Bonita evoked the themes of control and freedom as she discussed what she was looking for in her new answering machine: ''Simple to use and I could answer the phone or not, that I could override it, that I could answer it myself rather than have it answer it, and I wanted to make sure I could do that if I wanted to do that.'' As the interview unfolded, however, the darker side of the freedom/enslavement paradox readily arose in a dramatic metaphorical statement:

> *Interviewer:* What role is this [product] probably going to play in your life?
> *Bonita:* It will probably make me go and check it every day. I'll come home and that will be the first thing—check the mailbox outside and check the answering machine inside. So then in a way I will be a slave to technology, but it's not the first time I've been a slave to technology.
> *Interviewer:* That's an interesting phrase, a ''slave to technology.''
> *Bonita:* Well, I mean in a way any technology you get, once you get used to having it, you can't live without it.

Bonita also likened the machine to ''a plant . . . you got to do things for'' (e.g., checking the tape), further revealing the dependencies she felt were imminent in product ownership.

Two of our informants, a married couple, were sensitive to these paradoxes too. They also had just purchased their first answering machine, after a number of extended trips forced them to realize that they were missing important professional calls that an answering machine would have captured, a recognition of control and freedom issues. However, as Wally and Sally both explained:

> *Wally:* My wife and I are, at least somewhat, skeptical or cautious probably about loading up our lives with too many things, too many consumer products, because of the maintenance and the time that is required to take care of them and see if they operate properly and respond to their needs.
> *Sally:* We had been thinking about it for several years, but decided against it because actually I didn't want one because I felt like I didn't want to answer the phone if I didn't want to, you know, it would just be easier not to have to have it because it would always bind you into returning the phone call, but maybe necessarily you wouldn't have received in the first place, let alone have to return in the second place.

For several informants, ownership of technological products oscillated between control/chaos and freedom/en-

slavement in a reversible master-slave relationship. And, as with the negative dream episodes particularly, feelings of conflict, ambivalence, and stress were readily implicated.

New/Obsolete.   The new/obsolete paradox also surfaced regularly, perhaps because consumers experience it so consistently across many product classes, especially the high-tech variety. Bluntly stated by Jay Jaroslav (quoted in Flint [1995]), ''By the time a product hits the general market, it's long obsolete in terms of technology.'' One informant, Evan, had just purchased his first portable computer, after reading computer magazines and visiting retail stores. In our interviews he continually talked about the most recent advancements (e.g., faster processing units, larger memory, sharper monitors), which also made him acutely aware that whatever he bought would soon be leapfrogged by subsequent innovations. Evan admitted in his second interview, just six weeks after purchasing, that his machine ''is not outmoded [yet], but in another six months it will be. . . . I know I'm going to be envious of what's out there.''

Tony's story about computers evoked the same paradox. His company, a financial management organization, changed to a different model of computer that ''will obsolete the one we have at home'' (where he works occasionally). As he went on to explain:

> *Tony:* We have to pay personally [for the new computer at work] and plus we will have to retrain on the new software . . . so we feel a little bit betrayed by the technology because it has moved along so fast.
> *Interviewer:* You used the word ''betrayed.''
> *Tony:* Betrayed by the technology because it has such a short life span, it changes so rapidly.
> *Interviewer:* What's that betrayal about?
> *Tony:* The technology gets you to commit to it and then suddenly it changes.

Tony went on to lament the same outcome with respect to music products (e.g., records, eight-track tapes). Besides recognizing the new/obsolete paradox, Evan's and Tony's reactions of envy and betrayal also signify conflict and stress.

Competence/Incompetence.   Faith in science has often been accompanied by the belief that the development and use of technology reflect and extend the superior capabilities of the human species (see Asbell 1963; Canham 1950). However, Higgins and Shanklin (1992) found that fear of technological complexity was the most widespread concern among respondents in their study. This finding is understandable in view of the day-to-day challenges that consumers face in reading instruction manuals for setting up, operating, and maintaining technological products. It is not surprising that the paradox of competence/incompetence was also relatively salient among our informants. In discussing word processors, for instance, Carter pointed out the following:

Carter: It enables me to do something that I could not otherwise do to a standard that I would find acceptable. I probably would not do it. I would take it to work and say, ''Type that for me, please.''

Interviewer: So it helps you do something that you probably otherwise couldn't do?

Carter: Exactly. . . . I think in terms of the way that technology is being put into a product, it actually increases the, um, it has the potential to increase the ability and resources of the user.

Despite this, he went on to add:

I usually find that the more technologically advanced the product is, the more difficult it is for the average layman to understand how it works, to understand why it works, and what it is going to do, and how it does it. They don't know. It becomes more of a mystery.

More sarcastically, Goodman (1995) has observed, ''For the first time, many of us are living in a domestic partnership with machines whose primary feature is to make us feel dumb.''

In a different twist on this paradox, Tony discussed his decisions about buying audio technologies, blending the competence/incompetence paradox with the new/obsolete paradox.

I thought about buying [a CD player]. They look cute, they have all the attractiveness of most technological products, and the sound is really good and they aren't very expensive . . . but I'm just looking because I still have all of my 78s and 33s in a location where I can see them every now and then, which are getting obsolete and they just keep reminding me, ''You fool, look at all the money you put into those.''

Another manner in which the competence/incompetence paradox emerged was through age-based distinctions in the acceptability and use of new technologies. Our informant Suzie mentioned computer games such as Nintendo and went on to say:

I think that children who have this type of video game when they are very young, they get that eye-hand coordination going. I think that this is like kindergarten for the technology to come. . . . I think it's super but I think that I'm not in that generation, so this has totally passed me by. Totally. I'm out of it. It's past me.

Later in the interview she returned to this same point in mentioning her malfunctioning CD player.

I don't understand the CD player at all. I know that there's some kind of a laser thing in there that does the . . . but as to why it doesn't work and what could possibly be wrong, I haven't a clue. Not a clue. It's practically new. . . . I don't think it's planned obsolescence and I don't think that I abuse it. I just don't think that it works for me and my husband very well. We're careful! We're such old fogies, you know, we're so careful. And it's frustrating because neither one of us has any expertise in this particular area.

The verbatim passages from our interviews with Carter,

Tony, and Suzie reveal that consumers recognize how the sensations of progress and intelligence delicately alternate with feelings of regression and stupidity. These latter, darker elements often accompany an inversion of the common attribution bias in which people tend to attribute failures to things outside themselves. As such, technology ownership may represent a critical domain of life in which many people, especially those in older cohorts, experience ineptitude and resignation, pointing directly to the conflict and stress emerging from the paradox of competence/ incompetence.

Efficiency/Inefficiency. Technological products not only save time but can also consume time, at minimum requiring new time commitments that consumers do not realize until after they have tried or owned the technology. This paradox relates not only to high technologies such as computers, but also to low technologies such as vacuum cleaners and dehumidifiers (Goodman 1988). While this paradox was evinced in our data, it was not as commonly mentioned as the paradoxes previously described.

The positive side of this paradox was implied in several dream sequences, including the one quoted earlier about automobile travel via metal cables. An example of both sides of the paradox appeared in a spirited story about a new juicer appliance that Ed and his wife borrowed from a sister-in-law who had repeatedly touted its convenience benefits.

My wife filled the house with food. I mean pears, apples, strawberries, carrots. She was going to juice all this stuff up. And it was neat for about a day and a half and after that she got . . . it was a pain in the neck to clean it, you know, because you use it and then you got to take it apart and dump all the pulp, and so she was cleaning it. The juice was nice but it was a pain to clean and she used it probably three times the first day and maybe twice the second day and that was it.

Enthusiasm for the machine waned quickly, and Ed's wife gave the juicer back a few days later, opting not to buy one for themselves. In Ed's estimation, the time savings in actually creating the juice was offset by the time commitment required for maintaining the machine.

In a parallel discussion, Jack talked about the engineering lab where he works and the regular upgrades to computer software which he is expected to make for speeding up computer operations. However, as he complained, ''Invariably it takes a tremendous amount of time to do these upgrades and get yourself back to the same level of productivity that you were at before.'' He then asked rhetorically, ''Is it worth a week of time getting this system upgraded and [saving] 15 seconds for stuff I do six, seven, eight times a day?'' For him, the ongoing software upgrades are riddled with the efficiency/inefficiency paradox toward which he clearly feels ambivalent and somewhat anxious.

Fulfills/Creates Needs. The existential tension between fulfilling needs and creating others through technol-

ogy has been raised by social critics in the context of macro technologies such as nuclear power (e.g., how it generates cheap electricity as well as lethal waste material that requires safe disposal). At the level of possessions in everyday life, this paradox is relatively subtle, although it was discussed in striking detail by a few informants. For example, Charlene spoke about it after noting that technologies ''make life more comfortable, but more complicated at the same time.''

> *Interviewer:* OK, I find that a very interesting idea. What does that mean to you?
>
> *Charlene:* More comfortable is the fact that we have cars to get around in, rather than walking and it does not take so long and you can carry more with you when you go. It makes us more mobile. But you know, it makes life more complicated because you need to make sure that everything's in good working order or you won't get to your destination. And you need to have some basic knowledge of your vehicle to know that it is in good working order. So you need to know more, to know more to live in a society such as this. . . . Just because you know the IBM, doesn't mean that you can sit at a Mac and get something accomplished. Knowledge is very compartmentalized in a technical society and that can become overwhelming and frustrating.

According to Charlene, the specialization of complex knowledge and the requirement of continuous learning in today's technological world have a troubling emotional toll.

Related to a more mundane product, Hank also raised the fulfills/creates needs paradox.

> *Hank:* One thing that is real popular is weed eaters. They make trimming around things a lot easier, um, when you have to mow your lawn and everything. But what I've also found in having that thing, you might tend to not be quite as conscious about what you are going to trim. For instance, my wife putting her little flower beds here and there or planting trees and not really taking into consideration whether I am going to be able to get the lawn mower around this thing, am I going to be able to trim close to it. Like, no problem, we've got the weed eater! I think that's one product, it wasn't so much that you got the thing and it didn't do its job, but I think because it made something easier, the round about of it was that you ended up doing that thing more than you would.
>
> *Interviewer:* So the weed eater led to more . . .
>
> *Hank:* More weed eating! Right! And I think there are probably some other products that are that way. Most technological products do their jobs, and do them well, but I think a lot of times what they end up doing is generating more work. It is easier to do, but you got to do more of it.

Thus, as new technology enters a consumer's life, it can displace knowledge used to solve current problems, raise awareness of needs that the technology can address but that were not previously noticed, and require adaptations that are irksome.

Assimilation/Isolation.   This paradox has also been alluded to by historians and social researchers (e.g., Boor-

stin 1978), most often in relation to television and computers. It too, however, is a comparatively abstract paradox, not as widely articulated by our informants as other paradoxes. For example, Flora discussed telecommunication technologies, including her recent purchase of a caller-identification device (where the caller's number appears on a small display as the phone is ringing).

> *Flora:* Like one of my friends was insulted by it, so I feel bad, you know. I don't want anyone to feel insulted by it, because it's my friend. I'm happy to get their call, so I don't want them to be insulted.
>
> *Interviewer:* What do you think is going on with this insulting thing?
>
> *Flora:* Well, I think they feel they want to surprise me or something. They feel like they can never surprise me.
>
> *Interviewer:* That's interesting, other people's reactions to your technology.
>
> *Flora:* Well, usually you are at their whim. They call. They can hang up. They can leave a message or not [on the answering machine]. Why is that right? In this situation, the person on the receiving end of the call now has an equal amount of control because they can say, ''I don't want this person to leave a message.'' . . . For example, for sales people who make their living on the telephone, it's going to be a very negative thing. . . . For their life it's bad, for my life it's great.

While the meaning of Flora's caller-identification device varied among her friends and herself, pivoting partly around assimilation versus isolation, the double potential of the technology clearly precipitated conflict and anxiety in the context of her interpersonal relationships.

The assimilation/isolation paradox was also invoked in stories about televisions. Mandy discussed how she and her husband visited some distant relatives who kept the television on during the occasion, punctuating their interaction: ''We had hoped that we would sit and talk with them. . . . Well, the two kids were there and they had the TV on and that's fine for the children, but the two adults were watching it as well . . . so it was virtually a whole hour of this.'' Then, to make a contrast, Mandy mentioned a Super Bowl party where everyone clustered around the TV to watch the game.

> *Mandy:* There's an example of watching TV and yet you have a lot of people over, a lot of friends, and you have food and it's a party. And yet it is centered around the TV and a special program. . . . There's an example where you're socializing centered around the TV.
>
> *Interviewer:* And that's a little different than the socializing you did with your family.
>
> *Mandy:* Right.
>
> *Interviewer:* In that case TV was more of a hindrance to the social occasion.
>
> *Mandy:* It was, yes it was. Whereas I think maybe it could perhaps, whether it be a Super Bowl party or whatever, it could possibly be a facilitator.

Among all the paradoxes, salience for assimilation/isolation may have been the most gendered. Female informants seemed more attuned to this paradox, perhaps because of

their generally stronger tendency to be concerned with human relations and communal issues.

Engaging/Disengaging. The paradox of engaging/ disengaging is potentially the most abstract of all. Its negative quality resides at the center of the substantive theory of technology, which asserts that human reality is so pervasively mediated by buttons and knobs that human motivation and skills have been depleted. Stern and Kipnis (1993) found support for this claim among survey respondents who reported stronger feelings of competence and satisfaction when they used a lower, rather than a higher, technological version of some products. Alternatively, Celsi, Rose, and Leigh (1993) have suggested that technological developments in skydiving equipment have aided divers in taking risks, making complicated moves, and enjoying an exhilarating experience. Similarly, Hoffman and Novak (1996) reported human-computer interactions that indicate ''flow,'' that is, optimal experiences characterized by intrinsic enjoyment, loss of self-consciousness, and self-reinforcement.

A few of our informants alluded to this significant but subtle paradox. Parallel to the themes in Celsi et al. (1993) and in Hoffman and Novak (1996), our informant Trudy described feeling ''a little high'' when she used her new portable computer to work on the book she was writing. Some informants, nonetheless, directly recognized both sides of this paradox. According to Paula:

> I use technology, my life is easier because of technology. I appreciate what technology is, but sometimes I think that people lose a lot. . . . I think they forget to think for themselves. . . . You know, television as a technology has made us such a passive society . . . passiveness about, you know, relying on technology to do everything rather than having to do it yourself and not having to be the one being creative. You become passive and, um, I think the more passive you get, you lose the ability to ever become active again.

A more specific story came from Ed, who often hunted with a bow and arrows. He has owned simple wooden-stick bows as well as sophisticated metal-compound bows. As Ed explained, the compound bow works by a system of risers and pins that ''makes it a lot easier to pull back and a lot easier to hold.'' He went on:

> *Ed:* If you want to shoot better, there is no doubt that a compound bow is much more accurate than a stick bow is. But it is not accuracy I think that counts. I think the key to hunting is the feeling you get from just being out there and doing something that was done 200 years ago, in fact longer than that.
> *Interviewer:* What has technology done to the activity or the sport?
> *Ed:* It's mechanized it. It's changed it. It's made it easier. It's made it more accurate. But it has depersonalized it; maybe that's a better word. It has taken me away from it. I want to be involved in it.

For Ed, the compound bow dissociates him from what he believes is the original essence of archery. Hence, some

higher forms of technology may represent another significant source of desacralization in varied human activities (Belk, Wallendorf, and Sherry 1989).

Summary. The preceding section suggests that, to varying degrees, consumers recognize central paradoxes of technology. Some paradoxes such as control/chaos, freedom/enslavement, new/obsolete, and competence/ incompetence may be more salient overall because they are often experienced in relation to a range of technological products that are notoriously difficult to comprehend, frequently break down, and quickly become outdated. Other paradoxes seem subtler and more abstract, and thereby less salient across consumers. In addition, some paradoxes appear more associated with certain types of products. For example, the competence/incompetence and new/obsolete paradoxes were particularly related to electronic and computer-oriented products, where routines of operation are more complicated and the time between new generations of innovations is shorter. The freedom/enslavement paradox was readily related to automobiles because of the mythic meanings of liberty that Americans attach to cars and the reduced availability of other means of transportation. Assimilation/isolation was also naturally associated with telecommunication technologies and some entertainment products, especially television. Some situations also seem more likely to make paradoxes salient (e.g., product maintenance and repairs in relation to the freedom/enslavement and control/chaos paradoxes). Similarly, specific individual factors may moderate sensitivity to technology paradoxes, as it was suggested that middle-aged and elderly consumers are more cognizant than younger consumers of the competence/incompetence paradox, and females are more sensitive than males to the assimilation/isolation paradox.

Finally, consumers expressed a variety of emotions that provided indirect support for the proposal that paradoxes generate conflict and ambivalence, which kindle anxiety and stress. In fact, in several cases technology paradoxes wreaked emotional havoc, with feelings ranging from envy, foolishness, cautiousness, and frustration to fear, betrayal, and defeat.

Strategic Behaviors for Coping with Technology Paradoxes

Having established that consumers are variously aware of technology paradoxes and that they also experience associated conflict and stress, the next question concerns which strategies consumers undertake to cope with these paradoxes and emotions. Table 2 lists and defines the strategies we identified, while the following discussion elaborates on them through selected case data.

Pre-acquisition Avoidance Strategies. As Table 2 indicates, we identified three pre-acquisition avoidance practices (ignore, refuse, and delay). Together they represent a refinement of the more general notion of technology

TABLE 2

BEHAVIORAL COPING STRATEGIES FOR MANAGING TECHNOLOGY PARADOXES AND THEIR EMOTIONAL EFFECTS

Coping strategies	Emotional effects
Pre-acquisition avoidance strategies:	
Ignore	Avoiding information about the characteristics or availability of certain technological products
Refuse	Declining the opportunity to own a specific technological product
Delay	Postponing but eventually owning a specific technological product
Pre-acquisition confrontative strategies:	
Pretest	(1) Using someone else's technological product temporarily or (2) purchasing a technological product but not assuming definitive ownership until the return policy or warranty expires
Buying heuristics	(1) The latest, cutting-edge model; (2) a basic, less sophisticated model; (3) an expensive model; (4) a familiar, widely known brand; and (5) a reliable brand
Extended decision making	Taking stock of one's needs, searching diligently for detailed product/brand information, and then purchasing the most appropriate alternative in a careful, calculating manner
Extended warranty/maintenance contract	(1) Buying additional insurance at the time of product purchase to cover service and repairs or (2) buying an ongoing contract for periodic preventive maintenance and emergency repairs
Consumption avoidance strategies:	
Neglect	Showing temporary indifference toward a technological possession
Abandonment	(1) Declining or discontinuing the use of a technological possession or (2) leaving a technological possession unrepaired if it has malfunctioned
Distancing	(1) Developing restrictive rules for when or how a technological possession will or will not be used or (2) physically placing a technological possession in an unobservable or remote site
Consumption confrontative strategies:	
Accommodation	Changing tendencies, preferences, routines, etc., according to the perceived requirements, abilities, or inabilities of a technological possession
Partnering	Establishing with a technological possession a close, committed relationship of heartfelt attachment
Mastering	Dominating a technological possession by thoroughly learning its operations, strengths, and weaknesses

rejection as found in the diffusion-of-innovations paradigm (Rogers 1995). Although our data uncovered these three coping strategies in cases exhibiting a subset of specific paradoxes, as discussed below, each is theoretically capable of managing any paradox of technology. Hence in Figure 1 all three strategies are associated with the paradoxes.

An illustration of ignoring appeared in Mandy's comments about television and VCRs. She acknowledged their range of entertainment options (freedom) but also their addictive (enslaving) capacities. Although she and her husband owned a TV, they had disregarded VCRs over the years because "we felt like getting a VCR would encourage even more viewing of television." Ed evoked the same strategy in relation to the freedom/enslavement paradox.

> *Ed:* One of the reasons I don't have a telephone answering machine is if I'm not home, I'm not home. You know when I get home I don't want to have to be a slave to turn on the machine and see what messages I got and spend 45 minutes calling people back.
> *Interviewer:* Tell me more about that.
> *Ed:* I don't want to be tied to the technology. . . . I have people all the time say, "I'll fax it to you," and I will say, "Why? Put it in the mail. I don't need to have this thing this afternoon." . . . The technology is there

and so people use it and I can understand that. I just don't personally feel the need just because the technology is there to use it. . . . If there is a clear what's-in-it-for-me, then I will pick [the technology] up, but otherwise I am resistant.

Although Ed's story begins with telephone answering machines, his concluding remarks suggest that he often ignores technologies once he suspects that they do not serve a strong personal need. Employing the same strategy for a different paradox, our informant Paula discussed how she ignores computers because she has felt incompetent before when she could not operate them properly.

With respect to manifestations of the refusal strategy, a colorful example emerged from a story that Paula also told. She had serious concerns about leaf blowers, including their ability to fulfill/create needs and intrude on other people's lives:

> I think there should not be leaf blowers because all they do is blow them into the neighbor's yard or into the street for somebody else to deal with, and they're really loud, you know, and that annoys me and so you're infringing on us, you know, you're affecting my noise level when you use the leaf blower.

Paula went on to tell the story of how her car was stolen and recovered by police. Unexpectedly, a leaf blower was found in the trunk (left by the thief). The police

encouraged Paula to keep the leaf blower but she was adamant: ''I said no, I don't want it, I hate them. . . . There was a woman cop and she looked at me and leaned it against the car and said, 'It's yours!' She didn't understand why I didn't want a leaf blower, you know. She'd give it to me. It's free, but I didn't want it.'' As with Ed above, ignoring and refusing strategies were common with Paula, which suggests that some individuals have enduring coping styles for technology that resemble personality traits, paralleling and corroborating recent sociopsychological theory on managing interpersonal stress (Carver et al. 1989).

The coping strategy of delay also appeared as an effective approach to paradoxes. One informant, Maggie, articulated this strategy in discussing why she and her husband waited and did not immediately buy a new-model sports vehicle they admired. They were concerned that the ''bugs'' associated with first-generation technology (which can create chaos through constant repair problems) might not yet be known and removed. Another illustration of this strategy appeared in Tony's story about entertainment equipment, CD players particularly, as he wrestled with the new/obsolete paradox:

> I was talking to some of my clients the other night about CDs, and that is another technology that seems to keep dumping you now and then because it, uh, I sort of decided to opt out at least for a few years, because you never know, everything seems to be so temporary; you get a collection of records or CDs or whatever and it becomes obsolete.

As our informant Kim summarized this strategy, ''In waiting some, you safeguard yourself.'' Thus, although the delay strategy could logically apply to all paradoxes, it was particularly associated in our data with the control/chaos and new/obsolete paradoxes.

The diffusion-of-innovations paradigm classifies consumers who postpone technology adoption as the late majority or, ingenuously, as laggards. They are tacitly dismissed as antichange Luddites or social dimwits impervious to the technological advances that surround them. To the contrary, our data indicate that these consumers are often purposively delaying acquisition as a reasonable and conscious coping strategy. Simply labeling them as the late majority or as laggards fails to concede that some delays are prudent behaviors for dealing with key technology paradoxes.

Pre-acquisition Confrontative Strategies.   More aggressive coping tactics were also observed prior to ownership. Taken together, the pre-acquisition confrontative strategies, as compared to the other three genres in Table 2, represent behaviors that consumer researchers are apt to be more familiar with, though not necessarily as coping maneuvers and certainly not as strategies for managing paradoxes. Through our phenomenological approach, the pre-acquisition confrontative strategies constitute a reinterpretation of some conventional notions in consumer behavior in terms of a richer and more complex role in daily life.

The first of these strategies we dubbed ''pretesting,'' which took two forms (see Table 2). Pretesting helps the consumer to simulate the ownership experience and forecast six of the eight paradoxes in Figure 1, with the two exceptions being new/obsolete and freedom/enslavement. These latter paradoxes typically require numerous interactions for both sides to emerge, which a short duration of pretesting is unlikely to unveil.

Several examples of pretesting were manifested in our data. A distinctive illustration was portrayed earlier in Ed's story about borrowing a sister-in-law's juicer machine. Our informant Evan also borrowed a friend's laptop computer before making a definitive buying decision, but it was really after he ordered by mail and received his new laptop that Evan's hard-core pretesting strategy began. Evan was shopping for a state-of-the-art portable computer on a limited budget. Eventually he found one at a price he could afford, but it was also a lesser-known brand (Sager). The paradox of control/chaos was especially salient to him, as he worried that if it turned out to be a less durable and less reliable brand, he could have a number of repair problems and subsequent lags in his laboratory research. He dealt with these concerns through a dramatic pretesting strategy.

> *Evan:* It's a brand new machine and I certainly would not go with them if they did not have the money-back guarantee, postage paid both ways the first 30 days, and a one-year, no-questions-asked, service guarantee.
> *Interviewer:* What's the purchase price on the portable?
> *Evan:* Almost $3,000. But again with the money-back guarantee I plan to abuse it a little bit in the first thirty days to see if it will break. If it breaks, I will get rid of it and buy a different one and decide at that time which one to buy. . . . I definitely want to shake-test it, rattle-test it, and then just leave it on and make sure all the electronics don't have any glitches in them.

By aggressively pretesting the computer during its 30-day-return period, Evan strove to cope with technology paradoxes by shifting risks back onto the company. Although both forms of pretesting observed in our data are seemingly encompassed by the notion of ''trial'' from the diffusion-of-innovations literature, the extent to which some informants examined potential technological possessions, much more than the trials exemplified in the diffusion literature (such as free in-store samples or demonstrations; Rogers 1995), led us to use a different term and more intensive concept (pretesting). Although trial of technology also occurs in retail settings, its brevity and public nature do not provide consumers with the kind of natural encounters required to accurately gauge and prepare for the related paradoxes they will face in ownership. The examples of pretesting we observed showed how consumers go much farther than typical trial activities.

Consumers in the pre-ownership phase also used a range of buying heuristics to manage paradoxes. This category also has several forms, each related to different paradoxes. Five buying heuristics were mentioned by our informants: (1) the latest model, (2) a basic, less sophisti-

cated model, (3) an expensive model, (4) a widely known, familiar brand, and (5) a reliable brand. The first of these strategies addresses the new/obsolete paradox particularly, based on reasoning that the cutting-edge model of a technology at any given time will be the last in the current product class to become obsolete. Higgins and Shanklin (1992) found that technophiles were prone to use this strategy, presumably because they are more likely to know about and seek out the most recent models of technology. Our informant Evan, a physicist, partly exhibited this strategy in purchasing his new portable computer. He believed he was getting one of the most advanced portable computers available, even though the Sager brand name was not well known. Interestingly, the strategy of buying the latest model may make the consumer more vulnerable to an imbalanced control/chaos paradox, since the model is more likely to have unresolved operational flaws. As seen earlier, Evan dealt with this latter possibility by pretesting the computer vigorously.

As a group, the latter four buying heuristics seemed especially pertinent to the control/chaos paradox. The strategy of buying a basic model follows a logic that says less can go wrong with a smaller, simpler set of operating functions. Similarly, the strategy of purchasing an expensive model appears to be based on consumers' common theory that price and quality are highly correlated; the more you pay, the less likely you will experience the jolt and inconvenience of product breakdowns. The strategy of buying a familiar brand appears to presume a relationship between quality and top-of-mind status for the brand. For example, after years of delay, one married couple finally bought a telephone answering machine, although the husband still sounded some lingering concerns: "Most people we talked to have been through two, three, four, five machines in the last few years, so my sense is that this technology doesn't work very well and we're going to be locked into going through this over and over again." To cope with the control/chaos paradox the couple settled on a widely trusted brand name, AT&T. Buying a reliable brand is an obvious strategy for dealing with the same paradox, with consumers using word-of-mouth recommendations and popular product-testing and consumer-surveying publications (e.g., *Consumer Reports*) to estimate which brands are least liable to malfunction.

Buying a basic model also appeared as a strategy for coping with the paradox of freedom/enslavement. For example, our informant Bill intentionally bought a black and white computer monitor (rather than color) so he would not get "sucked in by the [video] games." Buying a basic model also appears to address the engaging/disengaging paradox, as implicated earlier in Ed's preference in archery for a stick bow over a compound bow. Finally, since basic models have fewer operating functions, buying one should also help to manage the competence/incompetence paradox.

Overall, buying heuristics have been studied extensively in consumer choice research and are typically char-

acterized in the information-processing paradigm as a means to simplify complex buying tasks (Bettman 1979). In view of our data, this orientation is incomplete, if not partly unfair and unflattering to consumers. Our data suggest that consumers do not always adopt buying rules because they feel dumbfounded and desire an easy way out of an arduous task. Rather, in some situations, buying heuristics reflect a savvy, proactive effort to manage technology paradoxes.

Opposite the heuristics approach, some consumers deal with technology paradoxes by engaging in extended decision making. For example, our informant Sam, a 75-year-old retiree, was considering the purchase of a lightweight, state-of-the-art miniature video camera. However, it also required an adapter and additional steps to play back the tapes, thereby evoking the paradoxes of fulfills/creates needs and efficiency/inefficiency. But, by purchasing in a patient, calculating manner, Sam selected a model that was optimally suited for balancing key paradoxes that were salient to him:

> *Sam:* And now they have smaller ones and super eights and eight millimeters and all that. I studied on those things for about three or four months before I finally picked [my] camera.
> *Interviewer:* How did you go about studying on them?
> *Sam: Consumer Guide.* The best model. What to look for, what features to look for. Then I bought the *Camcorder* magazine and read through there. Just to get a general idea of what to look for and what one was best. . . . If I had to do over again, today, after what I know, I'd buy the same model I have now.

Another of our informants, Bill, asserted at the outset that he and his wife are "pretty careful with our purchases. . . . Normally, we go to the library and look something up and check with friends and usually try to research something out before we buy it." His contrasting story of buying one of the earliest computerized typewriters also revealed the kinds of paradoxes that can be better managed through extended decision making. The first generation of word processors included an LED display where corrections could be made before printing. As Bill explained, "When we first got it, you know, it was, 'Gee this is kind of neat, we can type this quick and we can make these corrections.'" However, they soon realized,

> It was kind of limited, you could only see like maybe five to ten words at a time . . . [and] you had to buy this special heat-type paper that didn't look all that impressive. . . . You could [only] correct things in the display before it went to the page.

He conceded, "We didn't research the product. . . . We bought it on the spur of the moment. . . . I guess we must have been flush—had some extra money that day— 'Isn't that neat?' You know." Bill's story, which ended in disappointment and regret, was fittingly abstracted in a comment that our informant Jack made about what he perceived as the dominant approach to technology acquisition:

I think a lot of people are blinded by technology in general and they don't really evaluate cost-benefit ratios so much. . . . I think they look at it, instead of solving their problem or getting a solution for what they need, that they are more interested in getting the most technology they can buy.

The blindness that Jack mentioned and Bill exhibited reflects the technological imperative, that is, following the path of innovation without restraint and without regard for potentially negative consequences (Heller 1989; Pacey 1983). Nevertheless, some people we interviewed mirrored Jack's preferred buying logic and Sam's actual buying process, as described above. These informants believed that a responsible approach to managing several technological paradoxes is to consider one's needs thoroughly and then purchase the technology that best meets those needs, rather than buying impulsively or buying based on a preset budget (i.e., whatever can be afforded), both of which can lead to overbuying. In our data, extended decision making was described as managing the paradoxes of control/chaos, new/obsolete, efficiency/inefficiency, and fulfills/creates needs. Buying in a slower, methodical manner was thought to reduce the possibility of ending up with a technology (or a specific model/brand) that is unreliable, will soon be leapfrogged by new advancements, compels extra investments in time and effort to use, or generates unforeseen requirements.

A third confrontative, pre-acquisition coping strategy involved the attainment of an extended warranty or maintenance contract. Actually, this strategy can be enforced at purchase time (pre-acquisition) or later (during consumption). Both forms of this strategy appear to provide a sense of risk reduction and additional security regarding the turmoil ensuing from potential breakdowns and growing dependency on technology. Suzie's story exemplified this strategy.

The dishwasher is very important to me and dishwashers screw up. All the time. So I keep a contract on the dishwasher. . . . [Recently] I got my dishwasher built into a cabinet and it ran for about four months and then one day it just didn't work at all. It just made this horrible noise; nothing moved. And I called Sears and I had one day left on my guarantee and so they sent a guy out and he said the engine blew up! . . . So he replaced the engine and I got an extended warranty and I bet I only had the dishwasher for about four years and everything went wrong with it. I had those people out here all the time. The seals leaked, the rotating arms just twisted, the metal just disintegrated and threw it up into the dishes. So I keep the contract.

Suzie relied on her dishwasher to such a degree that once when it broke down and the repair person was late, Suzie piled the dirty dishes in the shower and turned on the hot water. Keeping a continual service contract was her attempt to balance the technology paradoxes of freedom/enslavement and control/chaos embodied in her new dishwasher. In addition to Suzie, at least three other informants told stories of extended warranties and maintenance contracts for managing the same paradoxes.

Consumption Avoidance Strategies. Once ownership is under way, consumers draw from an additional array of avoidance and confrontative coping strategies. Conceptually parallel to the ignore and refuse strategies of pre-acquisition are the neglect and abandonment strategies during consumption (see Table 2). Both neglect and abandonment are suitable for managing all technology paradoxes.

An example of neglect was contained in a sequel to Mandy's earlier comments about the paradoxes of televisions and VCRs (freedom/enslavement, assimilation/isolation). Although she and her husband had avoided buying a VCR for themselves, they eventually received one as an unexpected gift from his parents. However, as she divulged:

We didn't hook it up right away. . . . Part of it was a conscious decision that we're not going to hook this up right away and we didn't. And it was perhaps six to eight months before we hooked it up . . . and probably we did that before his parents were coming to visit.

One illustration of the abandonment strategy came from our informant Charlene, as related to the efficiency/inefficiency paradox.

Charlene: I don't use my dishwasher.
Interviewer: You don't, not at all?
Charlene: No. Never. I haven't used it since the day I got it. . . . It was my parents' and they got a new one, so they just gave it to me.
Interviewer: So how has it ended up that you never used it?
Charlene: There are only two of us at home now. It doesn't seem worthwhile, taking three days to fill up the dishwasher to wash dishes when it only takes 5 to 10 minutes to wash the dishes and put them away. . . . I mean, you know, you run out of dishes sometimes before three days or food gets stuck on them and you end up washing them yourself anyway. It's just not worth the trouble.

Carter employed the same coping strategy in relation to the family's first cordless phone.

Carter: It was a product that we got as a gift which I thought I was really going to enjoy.
Interviewer: In what ways?
Carter: I don't know. I just had great expectations for this thing called a cordless phone.
Interviewer: What kind of expectations?
Carter: Oh, freedom to move around, freedom to answer it anywhere, freedom to use it around the yard and I didn't really use it. . . . I had a lot of expectations about it which were probably totally unrealistic.
Interviewer: Unrealistic?
Carter: Well, who on earth wants to be carrying the phone in the yard when you're horribly wet and grimy and have the phone ringing and you probably have sweat running down your head? . . . And then when I wanted it, my daughters had it in their bedroom and it wasn't there because it had been taken off the base. At least with the cord phone you know where the phone is.

Interviewer: You said you didn't use it.

Carter: Didn't use it very much and the thing broke down and I never even got it repaired.

For Carter, abandonment of the cordless phone addressed an imbalance of the control/chaos and freedom/enslavement paradoxes that arose, in part, from what he perceived as foolish hopes. Interestingly, in Mandy's, Charlene's, and Carter's stories, neglect and abandonment were applied to products that were each received as gifts. In view of the widely acknowledged fact that many gifts are unexpected and ultimately unwanted (Sherry, McGrath, and Levy 1992), the secluding, recycling, returning, and selling of gifts may be more fully understood as occasional strategies for managing paradoxes. In general, it appears that when daily routines are intruded upon by previously unowned products, paradoxes become more salient and negligence or desertion become viable coping strategies.

Another inclusive coping strategy in the consumption avoidance genre, potentially applying to all paradoxes, is distancing. It takes two main forms (see Table 2), both of which are intended to limit interactions with the technology in order to manage paradoxes. The first, rule-based distancing, was seen in several cases. Maggie formulated policies about cooking with her microwave oven, partly to address the control/chaos paradox. As she noted about certain foods, compared to cooking in a conventional oven, ''You screw up faster in the microwave oven.'' Specifically, she does not cook potatoes in the microwave oven because ''the ends [get] hard and chewy and rubbery and [that] ruins the whole thing.'' Some informants managed the engaging/disengaging paradox through rule-based distancing. For instance, Paula noted, ''You're not so much part of the [cooking] process when you put something in a microwave and close the door.'' Some people, she notes, ''feel good when they are part of the process, who get the joy from the process of involvement and connection.'' Thus, Paula uses her microwave oven for the singular task of heating coffee in the morning. Similarly, Flora, whose passion is horticulture, will not take her portable phone into the garden so as not to interrupt the flow and sacredness of that special experience for her. Finally, in a prolonged distancing experiment, Jack and his wife decided to leave their television unplugged for an entire year, to cope with the freedom/enslavement and assimilation/isolation paradoxes it presented in their lives.

The second form of distancing involves the strategic placement of products. For instance, new owners of telephone answering machines were commonly concerned about obligations to monitor their machines constantly and return calls expeditiously (the paradox of freedom/enslavement). In response, two placed theirs on out-of-the-way tables in their master bedrooms, and, most dramatically, one couple located theirs in an adjacent studio building 50 feet behind their home, activating it only when they left town for long trips. Thus, these consumers dealt with the freedom/enslavement paradox by placing the new technological source of anxiety and stress outside of daily purview.

Consumption Confrontative Strategies. Three consumption confrontative strategies were identified (see Table 2). The first of these, accommodation, was consistently associated with the control/chaos paradox. Our informant Don provided two poignant examples.

Don: The clothes washer we have now has something wrong with the clock on it and it dumps the water before it should. So my wife has to spy on it and when it starts to dump the water, she moves the clock up another notch.

Interviewer: She spies on it? What do you mean?

Don: Well, she has to stand there and watch it and when it starts pumping the water out, she runs up and moves the switch up. . . . She's learned to live with it now.

Don applies the same strategy to his computer, given that he lives in an area renowned for its thunderstorms: ''I turn it off when lightning starts because I don't want it to get fried. But I accept that as one of things you have to do.''

The accommodation strategy was also evident in a case of new ownership of a video camera. As Harry explained, ''The only bad thing about the video camera, all video cameras, is they are made for right-handed people. . . . I'm left-handed and I'm also left-eyed. . . . You can't hold it on your left shoulder because the eyepiece only goes out one way.'' Asked about his reaction to this, Harry said,

I've learned to adapt to it. I've had to, but it is an unusual sequence. . . . You will notice the eyepiece is always projecting to the left but it is set to rest on the right shoulder because of where your hand fits. So if you set it up like this [he demonstrates] and I take my glasses off because of this, now by pulling it all the way I can get to the left eye. Now I can shoot.

Accommodation is sometimes effortless, but often not. In our cases it tended to arise as a disturbing echo of a slogan from the 1933 World's Fair: ''Science Finds—Industry Applies—Man Conforms.''

The basis for the second confrontative consumption strategy, partnering, in which a product or brand is treated not only as an animate being but also as a trusted teammate or companion, has also been recently highlighted by Reeves and Nass (1996) and Fournier (1998). This strategy reflects a more humanistic and feminine outlook on technology that emphasizes relationships of cooperation and respect (Rothschild 1981). Its role in managing paradoxes materializes here for the first time. Partnering was prefigured in some of the dream episodes created by the survey respondents (e.g., the laptop computer that planned its owner's every move). When this strategy arose in the interviews, it was typically employed to manage the control/chaos and freedom/enslavement paradoxes.

Paul, for instance, talked about his family's car, which they named Matilda. A recent trip encapsulated Paul's

partnering strategy and the paradoxes he was implicitly addressing:

> Just driving up and back we logged, I suppose, 1,700 miles on the car, you know, driving through the mountains of North Carolina and Virginia, down the Blue Ridge Parkway. . . . You know, we kept waiting for something to go wrong and it never did. It was the most surprising thing because it has never actually acted up on me, but it certainly has with Mary. . . . We haven't had any major problems with it; it's just this kind of feeling of vulnerability. . . . We were afraid that it was going to break down and it never did and we got back here and I think the first thing I did the next day as a kind of reward to the car, I wound up washing it and the next day I changed the oil, you know, that it had somehow earned this kind of treatment . . . giving Matilda her due. . . . I think the more you kind of interact with a thing the better you understand it, the more it means something to you on a personal level.

The same basic strategy was observed in the case of Trudy, who is a single mother of five children, a high school teacher, and an aspiring writer. Six weeks into the ownership of her new portable computer, Trudy was effusive: ''I love it. I take it almost daily to school. . . . I've written four chapters of my book. I couldn't have done it without it.'' At the six-month mark Trudy revealed an even deeper attachment to the machine, saying, ''It is my most treasured possession, except for my kids.'' Sadly, however, during this same time period Trudy's house was burglarized, and as a result the freedom/enslavement paradox surrounding the machine became especially salient. To cope, Trudy treated the computer as another cherished child, diligently watching over it.

> When I go to work, it goes with me. When I'm spending the weekend with somebody, it goes with me, even if I don't use it. . . . We took a trip to Washington, D.C., the kids and I, and the computer went with us. . . . I hide it in the very back of my closet, hide it under the bed, whatever, but that's the first thing, when I come in to look, and make sure that's still there.

Partly common sense and partly imagination, partnering is a striking coping strategy that is contrapuntal to the carelessness with which consumers treat many of their technological possessions.

The final consumption confrontative strategy was labeled ''mastering.'' Unlike the partnering strategy of equality and interdependence, mastering evokes a metaphorical frame of hierarchy and power. Through mastering, some of our informants sought to command the product so totally as to mitigate the negative side of four paradoxes. Mastering was used especially to reduce the probability of chaos, dependency, obsolescence, and incompetence.

Donna expressed the mastering strategy in relation to career tasks related to computers.

> *Donna:* I used to be scared to death of computers because they were just so, you know, one touch of the wrong button could mess it up so bad. But I got over it.

Interviewer: How did you get over it?
Donna: By being forced. My job depended on it. Being forced to learn it. It's funny. Once I got ahold of it, I really enjoyed it. . . . Once I started learning how to troubleshoot when, you know, you had a problem, it made it a lot easier for me to go and do that the next time. I started getting comfortable and I wasn't afraid of them anymore.

Like Donna's remarks, Flora's comments also related to freedom/enslavement and control/chaos and implicated the competence/incompetence paradox as well:

> *Flora:* I have a weird relationship with technology. It's like I have to master it, you know, I've got to know that I'm better than it. . . . I have to know how to work it otherwise I don't like it or, you know, it's irritating to me.
> *Interviewer:* What's irritating?
> *Flora:* I think it's an ego thing. Like I think I'm smart. . . . I should be able to read that book and be able to control that. There is no reason why I should have something in my house that I don't know how it works. So I sit down and figure it out until I control it.
> *Interviewer:* Is there any technology you have that you haven't mastered?
> *Flora:* Absolutely no.

Another example of mastering also appeared in Carter's discussion of the family's antiquated television set and new VCR. His story revealed how consumers can actively interweave different-generation technologies to enhance an older product, temporarily stabilizing the new/obsolete paradox.

> We have a relatively inexpensive TV. It is only about a 20-inch screen, no bells and whistles on it, a limited number of channels it can receive, and it's 10 years old. We bought it when we first moved here. But by buying the VCR we were able to use the functions so that we could expand the capabilities of the TV. For example, we never tune into a TV program, using the TV by itself. We always are doing the tuning on the VCR because it has the capability of going across all the channels. Therefore we have access to all those channels. The TV itself is a grotty little thing, miserable quality audio, but the VCR has a stereo receiver in it. Then that gets coupled into the full hi-fi and we've got as good a TV sound as anybody could possibly want. Remote control, up and down the channels, all the things that weren't on the TV.

In the cases above, consumers dealt with technology paradoxes by striving to master products through different methods. Trial-and-error learning, reading the instructions carefully, and using one technology to prolong the usable life of another were among the mastering mechanisms consumers employed to manage technology paradoxes.

Summary. Consumers invoke a wide range of coping strategies to address the paradoxes of technology. All avoidance strategies, at pre-acquisition or during consumption, are capable of managing the eight paradoxes of Table 1. Since avoidance strategies either deny or restrict the use of a particular technology, deductively then, the experience of associated paradoxes is circumvented.

Alternatively, confrontative strategies vary in their relative appropriateness for certain paradoxes. Pretesting is not suitable for the paradoxes of freedom/enslavement and new/obsolete because they require a longer period than most product trials permit in order to project dependency or obsolescence and stimulate subsequent responses. Data also suggested that a buying heuristic such as purchasing a basic model is useful for dealing with the paradoxes of engaging/disengaging, freedom/enslavement, competence/incompetence, and control/chaos, whereas purchasing a cutting-edge model addresses the new/obsolete paradox. As consumption ensues, the mastering strategy appears effective for coping with the paradoxes of new/obsolete, competence/incompetence, control/chaos, and freedom/enslavement, but not fulfills/creates needs or assimilation/isolation. Interestingly, the paradox that had the most coping strategies associated with it was control/chaos, lending further support to our proposition that it is the most concrete (see Fig. 1). It appears to have the highest average salience among the paradoxes, presumably because it is the most frequently experienced on a day-to-day basis.

Our data also suggest that some situations, such as the receipt of a technological product as an unexpected and unwanted gift, increase the likelihood of consumption avoidance strategies over confrontative strategies. In addition, some individuals seem prone to use certain strategies consistently, suggesting the existence of coping styles as person-level moderators of paradox response.

The Dynamics of Paradoxes and Coping Strategies

In conducting repeated and longitudinal interviews, we had a special opportunity to observe how consumers draw from the full range of strategies to cope with the paradoxes of different technological possessions and to track paradox sensitivity and coping strategies over time with new owners. However, the organization of the findings so far has somewhat camouflaged these crucial issues. To illustrate these dynamics more directly, we profile three cases here.

Our informant Kim, a single mother and full-time secretary, used a scope of strategies in relation to several technological products, some owned and some not. For instance, Kim discussed how she has refused to buy a lawn sprinkler system, despite living in a hot and sunny climate, because she worried that she would have to mow more often (fulfills/creates needs) and that the system would break down, requiring her to have the lawn dug up for repairs (control/chaos). In regard to the new/obsolete paradox, Kim delayed buying a CD player because she was concerned that DAT (digital audiotape) was on the horizon and would quickly replace CDs. Kim also talked of buying a simple telephone answering machine that "records, plays back, and that's all," effectively managing the control/chaos paradox that became salient when she saw other models with multiple buttons

and functions. She also implemented the rule-based distancing strategy in some contexts in order to cope with the engaging/disengaging paradox. For example, Kim uses her microwave oven for nearly every cooking task except baking a cake—"It's not *real* cake if it's not done in a conventional oven" (her emphasis)—and she will not activate spell check in her word-processing software because she feels it will diminish her natural verbal skills as well as the pleasure and pride of her writing experiences. Kim's stories and examples show that consumers are capable of shifting from one coping strategy to another to deal with salient paradoxes across multiple technological products.

From our longitudinal data of first-time owners, it became even more evident how paradoxes and coping strategies readily fade in and out of consumers' lives. For example, Kris was encouraged by police to buy a caller-identification device in hopes of tracing an anonymous harassing caller. "Beyond that," she said at purchase time, "I'm not entirely sure how useful it would be." She recognized, nonetheless, the contradictory capacity of the machine to assimilate her to other people ("I don't have to miss out on all my other calls to avoid this [harassing] one") and to isolate her at the same time ("You know who's calling and it's kind of like a screening device in a way. . . . It's just something that crosses a lot of people's mind that once you have this, maybe you're just not going to answer the phone because it's them"). To cope with this paradox, Kris derived a distancing strategy of placing the device in the drawer of an end table, "to keep it out of sight in case it might offend someone." Six weeks into ownership Kris reported that the harassing calls had mysteriously stopped and the device was now "just sitting out and we've had people over and nobody asks about it, nobody notices it, I guess." In fact, she and her roommate had developed playful guessing games with the caller-identification device that reinforced their bond of friendship (e.g., keeping lists of occasional callers and speculating each time who is calling before checking the displayed number). In this case, Kris alternated from one pole of paradox (worrying about interpersonal discord and isolation) to the other (enjoying interpersonal harmony and assimilation) as situational factors changed with time.

The case of our informant Sam, who bought his first video camera, was exemplary in manifesting the evolutionary nature of coping strategies from acquisition through consumption. Sam bought the video camera as an easy and improved way to record family history. He also wanted to take the camera wherever he drove, especially in the countryside, for spontaneous creative videotaping of objects and events that caught his attention ("If I'm going along the road and I see something that's interesting, I'll just take it out and photograph it"). However, Sam was also quick to opine, "I've seen too many things go wrong [with technology]." Thus, at purchase time the efficiency/inefficiency and control/chaos paradoxes were particularly evident to him. To deal with these ten-

sions, Sam engaged in an extended decision-making process, as described earlier in the section on pre-ownership coping strategies. Arriving home, Sam moved into the ownership strategy of mastering, as he read the manual several times and experimented with the camera around his yard and home. However, when he took it on a road trip and plugged the adapter into his car's cigarette lighter to record a wildlife scene, it ''blew the fuses in the car.'' Sam then adopted an accommodation strategy, giving up his desire to carry the camera in his car for unplanned videotaping on the roadside.

These cases and others suggest that individual consumers use a variety of coping strategies for different paradoxes and products, and for the same product as ownership evolves. Also, sensitivity to certain paradoxes may exist prior to purchase, toward which appropriate pre-acquisition coping strategies are enacted; then, as consumption experiences ensue, the same or new paradoxes may be manifested that necessitate similar or different coping strategies. At other times, consumers may not realize paradoxes at purchase time, but ownership experiences can then make one or more paradoxes salient, requiring an associated strategy. It is also apparent that sometimes paradoxes that were once salient will recede to the background as they are temporarily balanced, especially when interactions with the product prove to be unproblematic or as successful coping strategies become routinized. Thus, paradox salience and behavioral coping strategies are constantly arising, subsiding, and transforming as consumers and technological products interact through time.

DISCUSSION

Technological products are inescapable in contemporary life, and they harbor distinctive paradoxes reflective of wider trends in postmodernity. Our research has shown that consumers are variously cognizant of these paradoxes, suggesting an approximate ranking of the paradoxes according to abstractness (Fig. 1). Our research has also indicated that technology paradoxes arouse strong, often negative emotions that trigger an assortment of behavioral coping strategies. Furthermore, this process is moderated by product, situation, and person factors, and it evolves over time. Of course, our qualitative data cannot adequately appraise the role of mediators (emotions) or moderators on the route from paradoxes to coping strategies. Future research (perhaps with quantitative data collected in stages) is needed to examine these issues more thoroughly. Follow-up studies need also to expand the framework to consider the consequences of successful coping strategies in daily life (e.g., self-efficacy, product satisfaction, quality of life).

Implications for the Substantive Theory of Technology

Our results dispute aspects of the substantive theory of technology. One of its most significant claims is that technological products are so essential to contemporary life that their nature and effects are imperceptible (see, e.g., Druckrey 1994; Postman 1992). On the basis of the sensitivity our informants showed toward technology paradoxes, the premise of invisibility seems exaggerated and inaccurate.

Substantive theorists also assert that the ubiquity of technological products has eliminated the sacrifice of effort, the exercise of skill, and the intimate commerce with the world required in less technological eras (see, e.g., Ellul 1964; Winner 1977). However, several coping strategies we observed are aimed at regaining contact with reality, providing indisputable evidence of metatechnological activities that substantive theorists and other commentators (e.g., Borgmann 1984; Feenberg 1991) have wrongly lamented as relatively nonexistent. Indeed, the vitality of coping practices among our middle-class American informants rebukes the idea of wholesale complicity with technology decried by the substantive theorists. In addition, consumers' realization of technology paradoxes and their varied coping strategies suggest that technology is not as thoroughly indoctrinating of Western scientific values, nor is the control of technology in daily life as totally in the hands of scientists and manufacturers, as substantive theorists maintain (see, e.g., Ellul 1964). Overall, the substantive theory has failed to reckon with the conceptualization of postmodern consumption as an act of creative rebellion in which people engage in an array of behaviors, spurred by personal life conditions, that are countervailing to dominant long-standing ideologies (cf. Thompson and Haytko 1997).

Implications for the Diffusion-of-Innovations Paradigm

Our research also contributes to the diffusion-of-innovations paradigm. According to Rogers (1995), the diffusion paradigm has construed the influences of technology as three either/or outcomes (desirable vs. undesirable, anticipated vs. unanticipated, direct vs. indirect). For advancing theory on technology adoption, these categories are overly broad and do not adequately reflect the specific content and pressures of the cultural contradictions of technology. Our research refines the consequences of innovations by establishing a taxonomy of eight paradoxes that are fundamentally linked to essential myths and meanings surrounding the historical trajectory of technology, including the Western scientific ethos and American cultural ideals. For future research, another advantage of the taxonomy of paradoxes is that it may serve to mitigate two biases that have been consistently exhibited in the diffusion paradigm (Rogers 1995), namely, the source bias (favoring the manufacturer's viewpoint) and the positivity bias (assuming that new technology is always beneficial).

In addition, few researchers have attended to what motivates people to adopt innovations at different stages of diffusion (Rogers 1995). Our findings suggest that the

timing of technology adoption may be linked to motivations for managing certain paradoxes. For example, it is well known that being a technophile or innovator is reflected, in part, in the tendency to purchase cutting-edge advancements. Going beyond this basic insight, our work showed that this strategy can reflect a specific drive to address the new/obsolete paradox (i.e., delaying obsolescence as long as possible). By comparison, being a late majority or laggard buyer can reflect a drive to manage the control/chaos paradox, given that the reliability of many technologies tends to improve over time. Later versions of technological products often become simpler to operate, providing the late majority and the laggards with increased capacity to address the competence/incompetence paradox as well. Thus, the understanding of consumer motivations and innovation adoption decisions can be enriched by determining the linkages among technology paradoxes and coping strategies over the course of the diffusion curve. A concomitant contribution would be a refinement of segmentation strategies according to reasons for delaying technology adoption (cf. Greenleaf and Lehmann 1995).

Nonetheless, the diffusion paradigm has invariably characterized the late majority, laggards, and rejecters as homogeneous groups of technology resisters and technophobes. Our research exposes this predilection as potentially oversimplifying and even condescending. Furthermore, our work and other research suggest that the late majority, laggards, and rejecters have ample reasons to be skeptical and cautious. Companies today are increasingly committed to a competitive race of technological virility (Dhebar 1996). Too often technological developments are introduced because they are available, not because they are needed. Heller (1989, p. 27) argues that the ''blind pursuit of the technological imperative threatens . . . to interfere with sociological needs for safety and human dignity.'' Thus, contrary to the common wisdom of the diffusion paradigm, the defiant inclinations of many consumers to ignore, refuse, or delay adoption of technology are arguably quite judicious. Similarly, as with renowned groups of selective adopters and users (e.g., Inuits and snowmobiles [Pacey 1983]; the Amish and telephones [Umble 1992]), the consumption coping strategy of distancing also serves as an effective tactic among everyday consumers to slow the march of technology. Finally, it seems shortsighted to assign the characteristics of technology aversion or suspicion only to those consumers who are not at the forefront of adoption and use. Every technology, in view of its paradoxes, includes a sinister side that innovators also dread and seek to manage.

Implications for Human Coping Research

As we showed, insights from the interpersonal stress-management literature on the etiology and types of coping strategies can also be extended to the person-object realm of technology. One of our findings, however, is contrary to prior research, suggesting a need for further refinement to human coping theories. Researchers have found that not only are avoidance strategies less effective than confrontative strategies in reducing psychological and physical strain, but they may actually aggravate distress and increase future problems (Holahan and Moos 1987). However, in our data, avoidance strategies at pre-acquisition and during consumption did not emerge as inferior to confrontative strategies in reducing conflict and stress from technology paradoxes. In fact, there was often an air of superiority (human over machine) that accompanied consumers' successful efforts to ignore, refuse, delay, neglect, abandon, or distance themselves from technological products. Hence, although basic categories of human coping strategies may cross over from the interpersonal domain to the person-object realm, their relative consequences may not. Future work is needed to assess this finding in person-object areas other than technology.

Since our research was restricted to behavioral coping strategies, future inquiries are needed on psychological strategies. One reason we put aside a search for psychological strategies is that several of them may be subconscious, such as denial or repression (Glendinning 1990), and thereby less traceable in interview data based on direct questioning. Hence, projective techniques specially designed for this purpose could be fruitful. For example, thematic apperception tests may uncover psychological coping strategies as consumers create stories related to impressionistic drawings that depict specific acquisition or consumption events, such as the gift receipt, installation, maintenance, or breakdown of a technological product (for a comparative illustration, see Mick, DeMoss, and Faber [1992]).

Implications for the Paradox Concept

Whereas paradox has been a central concept in philosophy and growing in the social sciences, it has received limited attention in consumer behavior. In our project it proved especially valuable insofar as researchers have measured public attitudes toward macrotechnological issues for decades (e.g., nuclear power), often detecting conflict and anxiety without fully understanding their sources or influences (see, e.g., LaPorte and Metlay 1975). Future work could use rating scales to quantify more precisely consumers' perceptions of technology paradoxes. This approach would be especially suited for cross-cultural research, moving beyond the American setting of our work and determining which societies have similar or divergent views on technology paradoxes as the twenty-first century commences.

Nonetheless, the paradox concept certainly applies to other domains of consumer behavior besides technology. For instance, Thompson and Haytko (1997) found that the dialectical tension between being unique (individualistic) versus being common (part of a group) is vital to appreciating how young adults manipulate fashion in the fluid contexts of their daily lives. More generally, the

paradox concept fosters intriguing questions such as, What are the predominant paradoxes in a given domain and to what extent do consumers recognize them? What strategies do consumers use to manage those paradoxes? What are the personal, situational, or product factors that moderate the salience, emotions, and coping strategies for those paradoxes? Finally, and perhaps most important, Can the paradox concept be used to extend, modify, or develop new theories in the field? (For recent applications to advertising response, consumer satisfaction, and relationship marketing, see Mick and Buhl [1992]; Fournier and Mick [1998]; and Fournier, Dobscha, and Mick [1998], respectively.) In sum, paradox appears to be a highly relevant and resonant concept for advancing knowledge of contemporary consumer behavior.

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