AFTER ACCESS:
CHILDREN'S COMPUTING IN LOW AND MIDDLE INCOME HOMES

By

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Abstract

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At the turn of the 21st century, concerns about a growing 'digital divide' in the U.S. have led to a host of efforts to wire low-income communities and homes. Yet as technology access for low-income Americans has increased, what children and families actually do with computers after access has remained murky. This study provides a snapshot of children' computer use in 10 middle-income families, and 10 low-income families who were given free computers and low-cost access to the Internet. Through observations and interviews, the study maps differences in what children are doing with their home computers, the digital literacies they exhibit, and the family supports available to them as they learn to use computers for different ends. The findings suggest that middle class children are learning to appropriate digital tools in individualistic, instrumental and expressive ways that will likely serve them in the digital workplace, while working class and poor children, even when they have access to computers and the Internet at home, are not. At the same time, the study finds that the 'social envelope' of children's computing differs *within* middle and low income communities: parents in both types of households influence their children's technology use in subtle yet important ways, even while children use the medium to 'push back' against parental oversight and control. Challenging monolithic conceptions of social class as well as the notion that home computer access is an unambiguous good, the study maps the changing domestic landscape in which childhood and family life are becoming ever more digital.

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Table of Contents

List of Tables

Chapter One: Beyond the Digital Divide

This study examines differences in the ways youngsters in working- and middle-income families use their home computers, the computer-related skills they exhibit, and the family supports available to them as they use technology. The purpose of the study is three-fold: to add a more sociological dimension to current debates about the 'digital divide' and its consequences; to inform programs and policies that seek to help low income families use computers for their children's benefit; and to contribute to sociological theorizing about the relationship of information technology to social class and educational inequalities.

The research questions the study addresses are:

1) Are children in middle-income families using their home computer in ways significantly different from children in low-income families?
2) What roles do families, parents, and other home resources play in children's use of the Internet?
3) How might observed differences in use conceivably impact children's educational achievement or the advantages they might gain from social networks?

The goals of the study are thus to extend our understanding of the "digital divide" to include differences among children and families who use the Internet, and to explore how family influences are shaping not just children's skills with this particular technology, but a wider set of habits and orientations toward information media that may be advantageous in our increasingly information-based economy and society.

Background and Rationale

The Internet is increasingly recognized as an important site for sociological research because the medium uniquely integrates forms of communication and content, and is deeply implicated in new forms of social exchange at the most global and most intimate, interpersonal levels (Bell, 1977; Castells, 1996, Turkle, 1992). The Internet is also

important for sociologists because it is at the center of popular debates and policymaking concerning the social consequences of technology.

To date, research on the social implications of the Internet has focused on the medium's implications in five domains – inequality, community life and social capital, political participation, institutional organization, and cultural participation (DiMaggio *et al,* 2001). Generally the first two domains, inequality and social capital, have been examined separately. This study, as an ethnography of children's computing and the family practices that surround it in low and middle income homes, integrates these theoretical concerns – a traditional Marxian and Weberian concern for issues of power and inequality in access and control of the Internet, and a Durkheimian perspective that emphasizes the medium's relationship to communal life and social capital. By focusing on how *parenting practices* help shape children's *technological literacy,* the study explores how resources of social capital and technological capital are leveraged together to sustain, and sometimes recast, social class differences.

Most of what we know about the Internet and inequality comes from large-scale surveys that compile bivariate statistics on who is, and who is not, online (US Census Bureau, 2000; US Commerce Dept, 2000; Benton Foundation, 2002; Pew Center, 2001) – what has become known as the 'digital divide.'[1] Yet as more and more Americans from all segments of the population come online (NTIA, 2002), surveys of who is and who is not online have less and less value in understanding potential inequalities that may be involved in Internet use. For this we need a more nuanced examination of group differences in the ways people *use* the internet access they increasingly have.

Several scholars have suggested that the digital divide needs to be studied on a variety of levels. Kling (1998) has distinguished two dimensions of access: technical access (the

[1] National surveys by the federal government and private foundations have found that 86% of households earning $75,000 and above per year have Internet access, compared to 12.7% of households earning less than $15,000 per year. College graduates have Net access at a rate of 65%, while only 11.7% of households headed by persons with less than a high school education have Internet access. Finally, while the gap has closed somewhat, White and Asian American households continue to have Internet access at levels (46% and 58%, respectively) more than double those of Black and Hispanic households (23%) (US Census Bureau, US Commerce Dept, 2000, Benton Foundation, 2002; Pew Center, 2001).

physical availability of technology) and social access -- the professional knowledge and technical skills necessary to benefit from technologies. Dimaggio and Margate (2001) have suggested five dimensions on which social divides may exist: 1) technical means; 2) autonomy of use (freedom to use the medium for one's preferred activities); 3) type and pattern of computer uses; 4) social support networks; and 5) skill (one's ability to use the medium effectively).

Simplifying a bit, I offer a conceptualization of possible inequalities in three overlapping domains – the 'technological envelope', the 'skill envelope' and the 'social envelope' of home computing. This conceptualization responds to a review of the literature on home computing and social class inequality, which on my reading reveals a need for three things:

1) a more differentiated notion of Net access – as encompassing not just a technical connection to the Net, but also the quality of the technical connection and especially the social support to deal with problems that predictably occur with information technology*;* **(the technological envelope)**
2) more differentiated measures of net **use** that include the diversity of children's uses, and skill with a range of existing software tools -- such things as search strategies, the ability to evaluate the quality of information, etc. **(the skill envelope)**
3) closer examination of net use as contextualized by family life, by the decisions and behavior of both parents and children. This means examining how Net use fits into adolescents' *lives* on the one hand, and how adults, with their different parenting styles and practices, shape children's net use. (**the social, and especially family, envelope)**

An analysis of the skills – the human capital – that children exhibit in using the Internet needs to be layered with and against an analysis of the relationships – the social capital – within which they come to use the internet. A focus on the digital divide as a *literacy issue* allows us to merge the human and social capital perspectives in examining how social class and technology use interact. As recent literacy theorists have stressed, social capital is critical to the development of literacy's of all kinds (Hull, 2002). Humans

become capable users of language and sign systems only when such use is embedded in networks of social trust and reciprocity that enable them to 'try on' specific social identities as readers, writers and speakers (Gee, 1997).

A. Social class and the 'technological envelope' of home computing

Large-scale surveys of the digital divide typically classify households as 'online' if members say they have a computer with internet access at home. With this definition, two trends are apparent. First, there remain widespread disparities in Internet access by income, education and race (NTIA, 1998); second, these disparities appear to be decreasing, albeit slowly, as members of all socioeconomic groups acquire more computer hardware and internet connections (NTIA, 2002; U.S. Census Bureau, 2001).

There may in fact be a relationship between the two trends. Computer advocates have lobbied strenuously and quite successfully in the past five years for programs to reduce the 'digital divide' by putting networked computers into low income schools, libraries, community centers and homes. Private sector support for wiring disadvantaged communities has been especially popular. The non-profit organization that provided the computers used in part of this study, Technology Access for All, is a good example: TAA solicits funding and used computers from the businesses community, funnels them to low-income families in the New York area, and takes pride in displaying a growing roster poor households it has brought 'online'.

There are, however, good reasons to question whether giving families a computer and an internet service provider will be sufficient to get them meaningfully 'online' – especially low-income families. The first significant hurdle, one that appears even before we examine uses and skills, lies with what we might call the 'technological envelope' of home computing. Studies to date suggest that there are three important elements of the technological envelope: the *quality* of the technology resources available to children at home; the *troubleshooting knowledge* available in the family; and the willingness and ability of family members to communicate with *remote help providers*.

Becker (2000) found that when he looked at the quality of computing resources, an apparently narrowing digital divide suddenly widened: compared to more advantaged homes, low-income households had slower, more outdated computers that were often unable to use the Internet's multimedia content. Moreover, they lacked many of the peripherals that make computing productive such as a working printer or storage media, and they had a far narrower range of software for their children to use with the computer. In trying to account for these disparities, Becker found that one of the chief factors distinguishing households that provided broadly functional computers at home was whether parents used computers at work – a factor which varied with social class, and which suggests the need to examine parental inputs into home computing more closely.

An even more significant disparity may be the proximity of reliable *technical know-how* available in middle and low-income homes. For all users, the computer and Internet are troublesome devices requiring constant troubleshooting. In the Homenet study Kiesler and colleagues (1997) found that even with hardware and software designed for ease of use, people found the technology complex and difficult to use. Some of the families stopped using the Internet altogether rather than persist in the face of problems. Researchers found that a family's ability to evolve as Internet users depended on at least one member having a higher level of skill, confidence or enthusiasm and commitment to the technology; this person – often a teen but sometimes a parent – became the 'guru' for the family. Where no one in the family had this kind of knowledge and commitment, Internet use lagged and other family members did not develop much as users.

Other studies (Neuman et al, 1996; Howard, Rainie, and Jones, 2001) confirm that experience and confidence – not just in the household but in the extended family and among neighbors close by – matters. Katz and Aspden (1997) studied the role of social and work networks in introducing people to the Internet, and found that, especially for recent users, people learned to use the internet first from friends and family, second from learning at work, and third through self-teaching. Help-getting, then, is a 'network phenomenon'. And yet low-income adults and communities lag in technical know-how compared to their middle class peers, whether it is in years of computing experience (Danzinger et al, 1998), use of technology in educational settings (Hargattai, 2002) or the

availability of affordable and trustworthy computer retailers in low-income areas (Schon, 1998).

Even after they have a technical connection then, low-income families with less 'computing capital' at home or in their immediate social network may be less able to maintain a reliably functioning computer for their children to use. Of course it is possible that the vector of influence may run in the opposite direction – that low income children are a net *source* of computer knowledge and commitment for their relatively inexperienced parents and other family members. This is at least partly suggested by studies showing that teens are frequently the ones responsible for computer troubleshooting in their households (Keisler et al 1997), and by some studies looking at how Hispanic children and their parents interact around the computer (e.g. Kupperman & Fishman, 2002).

One of the problems in this area is that studies have not examined in enough detail the kinds of barriers that families and children encounter in keeping their networked computer functioning. Two particular hurdles deserving study are communication with remote help-providers, and interactions with Internet Service Providers or ISPs. The need for such communications is well documented -- Keisler et al (1997) found that 89 percent of families needed to call a telephone help desk during the first year of the HomeNet study – but low-income families face potential barriers such as speaking a language other than English, or lacking the minimal technical knowledge needed to explain a problem. Children in low-income families may be able to address *some* of these problems, but not others – for example, problems with faulty credit, or attitudes resulting from family history of negative encounters with customer service providers. Yet breakdowns in these areas of communications, as with more technical breakdowns, may render a networked computer effectively useless. In this study, I examine troubleshooting activities of both low and middle-income families in order to address this gap.

B. Social class and the 'skill envelope' of home computing

Researchers differ about the importance of technical skill in children's experience of computing. One highly influential notion is that computers facilitate children's 'natural' imagination by somehow bypassing the need to develop technical skills. This view is held by a set of psychologists and educators from MIT and elsewhere who have expanded on the work of Seymour Papert (1980). Positing a cognitive affinity between children and computers, they have created countless demonstration programs in which children engage in creative play with open-ended tools, building complex and interesting representations and communicating them to others -- with very little formal or explicit training (Harel, 1991; Papert, 1993; Resnick et al, 1996). Akin to 'whole language' advocates in the domain of early literacy, they hold that children easily absorb the skills involved in computer tasks, in the context of doing the tasks themselves: what is important is that children are allowed to engage in tasks that are personally meaningful. Significantly, these scholars stress that the cognitive affinity between children and computers is not gender, culture or class specific (Cassell et al, 2001; Chapman & Burd, 2001; Resnick et al, 1998) – hence 'powerful ideas' deriving from human-computer interaction are in principle open to children of all backgrounds, if they are given access in the right ways. Collectively this group has fostered a widespread belief in the importance of 'informal learning environments' (non-school settings such as after-school clubs, museums, community centers and homes) as places in which children – and especially girls and minorities – can most easily become creative and empowered users of digital technologies. While there is little evidence that informal computing has improved children's academic performance, there are many accounts of the cognitive, social and psychological benefits that accrue in certain instances from such things as creating video games, publishing web pages and building robots (e.g., Resnick et al, 1996).

The kinds of adult 'scaffolding' that surround successful informal computing are seldom detailed, however – leaving open the question of whether component technology skills are simply developed by children as a by-product of the activities, or are more or less explicitly taught or modeled by adults. In any case, other researchers have questioned the 'naturalness' of computer-based learning. They have found that without adult support, a low level of computer skill can frequently limit children's ability to do much of cognitive or educational value. Sefton-Green and Buckingham (1996), like Giaquinta (1994),

found that when youngsters were left to their own devices (as they were by most parents) they used their home computer mainly for solitary 'messing around', with little creative or academic outcome. They also found that having skills was a precondition of imaginative use, rather than the other way around. The idea of a 'naturally' computer literate child, they conclude, is more of a social construct than a reality.

We need to look more carefully at differences in children's home computer uses and skills for several reasons. First, there is the evidence (cited above) that a lack of computer skill can be a barrier to using the medium at all (Becker, 2000; Keisler, 1997). Second, skills plausibly constrain uses. For example, children who never learn to do an effective web search are unlikely to see themselves as researchers with the medium (as opposed to 'surfers') – and there is evidence that, at least up to now, children learn about using the Internet and email more from home than from school (Clements, 2002).

Third, there is reason to wonder if a bifurcation of uses and skills is becoming characteristic of online users – one group using the Net as a largely visual *entertainment* medium for recreational browsing and chatting, and the other, more select group using it, in addition, as an *information* medium, with textual, graphic and computational features all enabling them to find, filter and communicate information as they accomplish practical and intellectual tasks. Castells (1996) predicts that the web will be increasingly populated "by two essentially distinct populations – the interacting and the interacted", the former using the full potential of the medium, and the latter limited to "a restricted number of prepackaged choices."

There is some evidence that this bifurcation may be emerging in children's computing. The Children's Partnership (1999) reports that many of the underserved youngsters they surveyed found it difficult to use common internet tools like search engines, lost interest when information and education were connected with the Internet, and were drawn to sites more on the basis of their visual design and interactivity than their subject matter. In a more detailed ethnography, Attewell and Winston (2002) found that reading difficulties among the low-income children they studied hampered their completion of basic information tasks, but did not impede their enjoyment of highly visual and auditory

entertainment content. Studies find that children in *all* demographic groups – not just low SES children – do vastly more recreational than academic computing (Kafai, 2000; Pew, 2001 ; Giaquinta, 1994), but there are indications that children in advantaged homes may be more likely to pursue academic tasks *in addition* to recreational ones (Giaquinta, 1994), with possibly beneficial academic consequences (Attewell, 2003; Attewell & Battle, 1999).

A final reason to look at children's uses and skills is the changing nature of recreational computing, which may itself be becoming bifurcated by social class and skill level. In the mid to late 1990s game playing was overtaken by email as the most prevalent recreational activity among families (HomeNet, 1997), and beginning around 2000, Instant Messaging emerged as the most popular teen activity (Pew, 2001). Meanwhile a host of other recreational forms have emerged (and sometimes waned), including music downloading, simulations, networked game playing, and now, web-logs. While many of these activities (e.g., music downloading and Instant Messaging) have only marginal cognitive and literacy demands, others (e.g., simulations and web-logs) require more substantial investments of skill and cognition. Accordingly, I will examine whether the low and middle income children in my study are engaged in more or less cognitively demanding forms of recreation with their computers.

Very little empirical research exists on the skills that are needed to use technologies like the Internet effectively. Despite widespread demands for greater technological literacy in the US population (ITAA, 2000) and efforts to conceptualize what fluency with digital technologies is (International ICT Literacy Panel, 2002; International Society for Technology Education, 2000) very few empirical studies exists on the skills that people need to use technologies like the Internet effectively (Hargattai, 2002).

Psychologists, educators and literacy theorists help to explain the cognitive demands that using the internet for informational purposes places on users. First, for all its increasingly visual and auditory character, the web is still a print-intensive medium, yet one in which design protocols for writing and publishing are rudimentary, at best. This means that the novice web reader confronts a chaos of print formats and layouts that conform to no

teachable set of expectations, putting a premium on his or her ability to flexibly adapt to novel formats and flows of text (Rouet, 1996). It is also, at the same time a multimedia medium, meaning that novel flows of text are often accompanied by images, animations, sounds, movies and links to follow -- a high number of 'distractors' that readers must cope with. Third, it is an associational medium, in which users constantly encounter links to 'related material,' in search results or in hard-coded links. The 'relatedness' of related materials is frequently problematic, however, and often turns on the spelling of a word, or a shift into a new discourse or discipline. Links instantly take users to pages created on wildly differing assumptions about the reader's age, reading level, background knowledge and intent -- again requiring a remarkable cognitive flexibility (Olsen, 1993). Fourth, the Net is characterized by a superabundance of information – requiring filtering skills of searching, judging and re-defining what one information wants and needs – that have not been taught in schools or homes up to now – particularly the use of sophisticated search tools. Finally, the Net is a medium with a comparatively low threshold for participation as a creator and publisher, meaning that questions about the cultural and intellectual authority of materials and communications arise more frequently than with other media – and this puts a premium on users' capacity to evaluate sources, bias and intent.

It is in this context that Attewell and Winston's (2001) findings are important. The low-income urban children in their study found it difficult to execute even an apparently straight-forward task like a web search, because the task involved a level of print literacy and cultural background knowledge that they lacked. The researchers conclude that existing language and educational disparities, amplified by technology, may well lead to the scenario envisioned by Castells (1998) of two sets of web users – the 'interacting' and the 'interacted'. Even when working with college students in an explicitly pedagogical and literacy context, Warschauer (1999), found that despite its richness, internet use involved education and language requirements that many students struggled to negotiate.

Similar studies are surprisingly few. Researchers in library and information science have examined how people locate content online, but their studies have focused on particular academic communities (for example graduate students in library science, Wang, Hawk

and Tenopir, 2000) or college students in general (Cothey, 2002) and this makes their findings difficult to generalize to children as users (see Jansen and Pooch, 2001 for a review of this web-searching literature). These studies also tend to focus on the technical aspects of searching – and do not examine whether demographic variables might be contributing to differences in how people find material online. One exception is Hargattai (2002) who found widespread differences in people's ability to conduct web-searches, but whose research involved adults not children, and factors of age and gender, not social class, as the present study.

Like Hargattai's, most definitions of information technology literacy have described rather narrow skills with specific tools – the ability to use a word processor, or a search engine, or configure an I/O device (Adams 1984, Inskeep 1982, Gilster, 2000). While such definitions have the virtue of specificity and measurability, they also present problems. First, they are quickly obsolete because of the rapidly changing nature of technology. (In the 1970s, definitions of 'computer literacy' involved identifying floppy disks and programming in BASIC (Inskeep 1982), while in 2000 'digital literacy' includes the ability to unzip a zipped file and upload files to an server (Gilster, 2000)). In addition, such tool-dependent definitions typically enumerate countless specific skills, begging the question of whether literacy entails the development of more general or 'metacognitive' capacities that people may apply across tools. What is needed are ways to operationalize technology skill that bridge tools and purposes, examining for example how communicative purposes are accomplished using email, or how a sustained inquiry is conducted via the web. Fluency with new technologies involves not only knowing how to use technological tools, but also knowing how to construct things of significance with those tools (Committee on Information Technology Literacy, 1999; Resnick, 2001).

C. The 'social envelope' of home computing.

A key theoretical debate informing sociological work on the Internet and inequality concerns whether the medium represents opportunity, or reproduction. Enthusiasts for digital networks predict that their structural features will help flatten institutional hierarchies and widen political and cultural participation by the poor, women and others

of the 'information disadvantaged' (Reingold, 1993; Benton Foundation, 2000). Skeptics argue that the Net's embeddedness in unequal institutional structures means that more advantaged users will simply use it to leverage their greater resources, reproducing and even amplifying existing inequalities (Dimaggio & Hargatti, 2000).

When it comes to children's home computing, understanding the 'reproduction vs. opportunity' dichotomy means examining, in part, an intergenerational struggle between adults and children to shape the medium and its uses. In this context, two broad possibilities exist. At the 'reproduction' end of the continuum, social class (largely through the medium of the family) exerts itself on children's Internet use; children's technological fluency is constrained by their family circumstances. At the 'opportunity' end of the spectrum, children in using technologies 'push back'; they creatively leverage technology along with their other social resources and in doing so forge new opportunities for themselves, and possibly even their families.

These alternative possibilities can be expressed in two sets of questions:

• First, to what extent *do family social class or ethnicity shape children's Internet use* and the advantages or disadvantages that may follow from it? How do such things as family resources, parenting practices, and orientations toward schooling influence what children do on the Internet, and its potential consequences? For example, are high SES families helping their children use the Internet for cognitively advanced tasks, while low SES families leave children to chiefly recreational uses? [reproduction questions]

• Second, and conversely, to what extent *is the Internet a youngsters' medium*, over and against the pull of family? That is, are youngsters through their Internet use actively altering their relationships to parental, peer and educational structures and authority? For example, while using their home computers are poor and immigrant children, as well as middle class children, developing types of technology knowledge, cognitive skills, social relationships or degrees of confidence that their parents would be hard-pressed to provide -- and that are in turn socially acknowledged and potentially rewarded? [opportunity questions]

The Internet has unquestionably given adolescents an expanded field of interaction and sociation, one that is largely beyond the direct monitoring and control of the adults in their lives. A host of software developments in the past five years – the emergence of Instant Messaging, the creation of youth-oriented chat services and bulletin boards, and the explosion of youth-oriented content – have greatly increased the 'presence' of teens online compared to other demographic groups. Over 13 million 12 –to-17 year olds use Instant Messaging alone, according to one large survey (Lenhart et al, 2001), and the total number of teens online totals over 17 million, or 73% of the children in this age group.

These developments are being felt in households and families. Numerous studies find that teens are the heaviest users of the Internet in their households (Kafai, 2000; Becker, 2000), that parents find it difficult to monitor or control their children's Internet use (Pew, 2001), that children's technical expertise in comparison to parents sometimes inverts the usual parent-child hierarchy (Becker, 2000), and that parent-child conflicts occur around the technology with regularity (Lenhart et al, 2001).

Studies of technological and social change suggests that 'reproduction vs. opportunity' is less a dichotomy than a dialectic, the historical process through which social actors and institutions bend new technologies toward competing purposes, and are in turn subtly transformed (Bijker et al, 1999; Hoynes and Croteau, 2002). Thus, the dialectical tug-of-war between youngsters' energies in using the medium for their own ends, and the shaping influence of parents, families and social class is part of the drama this study seeks to track.

In an early study of home computing among middle class families in New York and New Jersey, Giaquinta et al (1994) coined the term 'social envelope' to refer to the configuration of social expectations or arrangements that envelop a technology - which, if left unaltered, will lead people to use any new technology in a way that conforms closely to existing purposes and expectations.

This study examines three important aspects of the 'social envelope' of home computing for children that existing studies have found to be important, but about which too little is known – the autonomy of children's computing, parental computer experience and knowledge, and parental inputs and style in child-rearing.

The *autonomy* of children's computing refers to a child's ability to use the computer when he/she wants, for the purposes he/she wants. Here the number of computers per household, the location of the computers, and adult habits of monitoring and supervision matter greatly. Middle income families have more computers per household than low-income families (Kafai Y B, 1999; Venkatesh, 1996) so that individual children have more opportunities to use them, and use them in ways they want. Location is important to autonomy (since this often dictates whether one can use the computer seen or unseen by others) but with few exceptions (eg, Venkatesh, 1996) studies have not examined how computer location, and attendant patterns use, may vary with social class or ethnicity. But other factors influencing autonomy include household rules – e.g., about hours of use, purposes of use, and Internet destinations allowed – and the use of parental software controls that may enforce these rules.

Parental computer knowledge and experience is correlated with income and education generally (NTIA, 2000), but studies are divided about how much it matters. Some studies find that children act mostly autonomously and without parental supervision (e.g., Orleans and Laney, 2000), while others find that parents and families exert various kinds of influence, such as purchasing software, troubleshooting and teaching (e.g., Keisler at al, 1997; Giacquinta, 1994; Attewell & Battle, 1999). The research on this question is equivocal partly because 'parental involvement' has generally been construed narrowly, as direct physical monitoring or instruction by parents. What is needed are efforts to examine forms of parental involvement that are more contextual (e.g. choices of computer location that permit monitoring vs. privacy) and linguistic (e.g., inculcating values and attitudes through talking about internet use) as well as technological (e.g., using software 'parental controls' to constrain children's internet use).

Parenting inputs that affect home computing and its consequences may be much wider than the current research suggests. From a sociological perspective, it is critical to see the family and household cultivating habits and orientations toward print and popular media (Heath, 1983), while at the same time being influenced by those media and the habits and tastes that children develop independently of the family. Media and family socializaton are in dynamic relationship: media are constantly changing the environment in which children are socialized; and families are constantly making decisions about media use that affect children's development.

There are as of yet no studies on the Internet and family socialization processes, but work on television serves as a template. Myerowitz (1985) and Postman (1985) separately analyze TV as changing the dynamics between parents and children, in part by making children party to adult 'secrets.' Meyerowitz believes that television has created a pressure on parents to move away from the role of a 'spoon-feeder' of selective information they deem appropriate for a given age, toward more equal participation with a well-informed and unembarrassed child. These writers suggest that with the advent of electronic media socialization is undergoing a shift in definition from the provision of information to the *interpretive and evaluational framing of information* to which the child gets exposed, willy-nilly. Compared to television, the Internet privatizes the flows of adult-oriented information which children access in the home, arguably putting a further premium on interpretive and evaluational framing. I believe that this interpretive framing of learning – in the double sense of learning via the medium and learning about how it works -- is important with the Internet as well (Leibes, 1992). Researchers find that social class differences exert themselves increasingly at the stage of early adolescence, as some but not all parents model uses of literacy in the home, work to make literacy activities fun and meaningful, and engage children in extended discourse in ways that build their skills toward more complex language use (Snow & Tabor, 1996; Heath, 1983). Thus far no studies have attended to parents' habits of talk and interaction with children during and after their children's computing, a gap this study seeks to address.

Attending to middle and working class parenting habits also puts this study squarely within terrain explored recently by Annette Lareau in *Unequal Childhoods* (2003). In a

lengthy ethnographic study of 20 families, Lareau found broad differences in middle and working class parenting, irrespective of race. Middle class parents pursued an ethic of 'concerted cultivation' whether they were black or white – they scheduled children's leisure time full of outside, adult-led activities (like sports, lessons and tutoring); they argued with children over directives, giving reasons (and having to listen to counter-arguments); and they advocated vocally for children with outside institutions, such as the school. Working class and poor parents, whether they were black or white, pursued 'the accomplishment of natural growth' – they left children to figure out how to use leisure time on their own, they gave directives that elicited little argument from children, and when faced with problems in school or other outside institutions, they tended to acquiesce or withdraw in frustration. Following the theoretical model of Bourdieu, Lareau argues that these patterns of childrearing have important consequences for children, leading middle class children to acquire a 'sense of entitlement' as well as skills and habits that schools and workplaces will recognize and reward, while working class children acquire a 'sense of constraint' and few of the skills that will garner opportunities and rewards.

If the parenting patterns that Lareau finds hold true in the current study, we should expect to see middle and working class parents structuring children's time with computers and media in distinctive ways, issuing directives and verbally interacting with children differently, and perhaps interacting differently with the school and Internet service providers as well. In fact, as Chapters Three, Four and Five document, broad differences in parental skills and resources do seem to play an important role in children's computing and its skill outcomes. However I found important differences *within* both working and middle class cohorts when it came to parenting around media. As Chapter Six details, working class immigrant strivers engaged in different parenting around media than did their poorer cohorts on public assistance. And while I found that roughly half of the middle class parents pursued Lareau's ethic of 'concerted cultivation' around media, half pursued a distinctive middle class parenting approach I dub 'laissez faire' parenting. Accordingly, in relation to the sociology of parenting and social class, I believe this study does two things. It adds media – and specifically digital technology – to the landscape of parenting as studied by sociologists; and it complicates the picture we have of middle and working class parenting practices, as revealed by Lareau (2003) and others.

Organization of Chapters

The computer and Internet constitute a new 'field of interaction' for family members and households. In homes as in other social spheres, the novelty of digital technologies has led many researchers either to simply catalogue mundane family activities or, at the other extreme, to speculate wildly, often on the basis of little concrete evidence, about the dramatic new social relationships being forged by and with the medium. The shape of this thesis reflects my wish to avoid the latter entirely, and to steer a middle ground between describing behavior and activity on the one hand, and speculating on both social influences and consequences on the other. Chapter Two describes the methods used in gathering and analyzing data, and the character of the two communities in which the research took place – a low-income, urban neighborhood in Southchester, and middle-income neighborhoods suburban Elmhurst, New Jersey. From this point, the organization of chapters moves successively from descriptions of what children are doing (Chapters Three and Five), to analyses of the circumstances, socio-economic and parental, that shape what they are doing (Chapters Four and Six).

Chapter Three presents detailed portraits of the computing that children are doing in Elmhurst and Southchester. We see Elmhurst children using the computer and Internet more robustly than their Southchester peers to chat with friends, to work on school assignments, to play games and sometimes to pursue creative projects. We see Southchester children spending less time on the computer, and mainly doing routine schoolwork and playing simple games, but also using the computer alongside siblings and parents, in a more collective and social way than the Elmhurst children. In addition to these cross-community differences, we note interesting differences in children's computer use *within* each community. Some Elmhurst children spend long hours online chatting and browsing as a way of coping with their boredom, while others pursue creative projects around things that interest them. Meanwhile, in Southchester, some immigrant children use the Internet to help increase their own and their families' educational opportunities and income, while others appear to use the Internet, along with other media, as a means of distraction from chaotic life and household circumstances.

Chapter Four discusses some of the major structural circumstances, economic and social, that shape what children do with their home computers in the two communities. Differences discussed include the initial quality of computing resources, parents' computing skill and experience, access to technical help, the size and organization of homes, the local school's approach to computing, household gender relationships, and wider community resources available in Southchester and Elmhurst. Each of these factors, I found, helps to enable or constrain home computing practices in important ways.

Chapter Five examines the different skills or 'literacies' of children in the two communities. When it comes to computing most Southchester children, we find, are learning to function as 'scribes' – able to perform routine information tasks with the basic features of software applications like web browsers or word processors. If they encounter information they need on a web page, for example, they can copy or type the information into a word processing document, but in doing so they make few changes or additions to it. And when challenged with a task that asks for more – one that calls on them to judge the meaning or quality of text or imagery they find online, they have difficulty. Most Elmhurst children, by contrast, are learning to function as 'surfers' – able to move with ease through different software applications, and through large amounts of text, imagery and audio, using search tools and other aids to sift and steer towards information they want and need. And when asked to, they find it easier to read, interpret and also transform the information they find online, including, sometimes, for personal and expressive ends. I suggest that these differences in skill may add up to distinctly different *orientations* toward digital technology and information – and further, that information workplaces are likely to reward those who possess the orientation being developed informally in middle class homes, further disadvantaging those raised in homes without it.

Chapter Six deals with what I call the 'parenting paradox.' A core task of parenting is raising children with the skills, habits and orientations necessary first to succeed in school, and later to find and maintain adequately paying work. Computers and the

Internet are structurally ambiguous with respect to this task. On the one hand they are tools of work, learning and discipline – hence important for schooling and employment opportunities. On the other they are instruments of leisure, peer interaction and pleasure – hence important to adolescent identity and social life. Behind these two faces of the computer stand powerful institutional 'interpreters' of digital media: schools on the one hand, and commercial software makers and entertainment media on the other. One result, I found, is parental consternation. Parents buy computers hoping they will support their children's school learning, and set them up in home offices surrounded by the hallmarks of focused work habits – special table, desk lamp, paper, pens, reference books nearby. Days or weeks later, what they get is their adolescent children spending hours slouching in front of the screen playing games, browsing websites about TV shows, and chatting endlessly with friends, or perhaps strangers. How parents in Southchester and Elmhurst deal with this, drawing on their different knowledge of the computer and their different orientations toward parenting, is the subject of Chapter Six. In it I describe contrasting styles of both middle class parenting (concerted cultivation vs. laissez-faire) and working class parenting (aspirational parenting vs. the accomplishment of natural growth), and some of the consequences I saw associated with each. In the end, I suggest why the use of digital media at home will continue to be an area of struggle and renegotiation between children and adults, as new technologies of work and leisure are developed and absorbed into the domestic sphere.

Chapter Seven summarizes the main themes and findings, and offers some concluding speculations about the project of equalizing opportunities for children when it comes to digital technology.

Chapter Two
Studying Children's Computing in Two Communities

Design of the Research

The portraits of children's computing here are qualitative, based on interviews and observations in 10 middle income and 10 low-income families between September 2001 and August 2002.[2] The comparative nature of the design enabled us to look *across* two communities, as well as *within* the communities to see how income, education and cultural resources influence children's computer knowledge and computer use in specific ways.

Subjects were recruited in two communities: Southchester (largely working class and poor), and suburban Elmhurst, New Jersey (largely middle class). The Southchester families were recruited through Technology Access for All (TAA), an organization that provides free computers to low-income families. TAA had given home computers to students attending two Southchester middle schools, the Academy for Scholastic Excellence, as well another neighboring middle school. Every 7th and 8th grade student in these schools was given a flier by his or her computer teacher to take home inviting the family to participate in the research. The recruitment pool consisted of 18 families who responded to the invitation by returning the form within the specified three weeks.

The Elmhurst families were recruited via 7th and 8th grade class lists from the town's middle school, available to the researcher because his children attend other district schools. The researcher selected families from these lists at random and called to explain the study and determine if the family had a home computer with Internet access for at least six months, and was willing to participate in the study.

Participating families were selected from the available pools based on four core criteria.

[2] The interviews and observations were conducted by the researcher and one other colleague as part of their work at the EDC Center for Children and Technology. The study was designed with this dissertation as one of its intended outcomes, the other being an evaluation report to the non-profit organization TAA, which provided computers to the low-income families. All permissions for use of these data for a CUNY sociology dissertation were secured in advance.

In both communities we sought a racially diverse mix, households with children in the seventh or eighth grade, a range of educational achievement levels, and access to at least one Internet-connected computer in their home. Before participating in the study, all parents and children were asked to read carefully and sign informed consent documents.

We visited each family three to four times over the course of 12 months, to conduct 1) an introductory interview with the middle school age child and one parent; 2) observations of the child's use of the computer for routine tasks like searching the internet or using email features; and 3) a closing interview with the child and parent. The researcher took field notes of observations and interviews; interviews were also audio taped when the subjects gave their permission for this. Each visit occupied approximately one and a half to three hours. For Spanish speaking families (of which there were several in the Southchester school community) a Spanish-speaking research assistant accompanied the researcher and helped conduct the interview.

Research Instruments. Research instruments developed for the study included protocols for the parent and child interviews, and observational protocols for home visits and children's computer uses. The parents' interview focused on information about family demographics, technology use and its meaning, schoolwork and leisure activities, parenting routines, and family social networks. The children's interview focused mapping children's use of time at home, after school and on weekends (including homework, play, use of broadcast media and computer use), and children's social networks and family relationships. We developed semi-structured tasks designed to help children convey what they did with their computer and the Internet, and what level of general computer knowledge they possessed. These included a) a 'pie drawing' exercise in which children drew and annotated pie-charts to show the relative amount of time they spent on different activities, b) a 'guided tour' of their computer's desk-top which helped reveal what they did most on their computer and their familiarity with major software tools, and c) web-searching and website evaluation activities that helped us gauge these information skills.

Researchers made a total of 59 home visits to these families (approximately 3 visits per family) to observe computing practices and family environment, and to engage children

and family members in interviews and computing activities. Home visits lasted approximately two hours and were conducted between the months of September 2001 and August 2002.

Southchester Families and Their Children

Ten working class and poor children and their families were the focus of the study. Eight of the families had children enrolled in the Academy for Scholastic Excellence (ASE); two had their children enrolled in another neighborhood public school, the Power through Arts and Community (PAC) School.

Table 2.1 summarizes the demographics of the ten Southchester families. In this overview I describe these families in terms of their income and employment, education level, race/ethnicity, and lifestyle characteristics. We then describe the computing environment in the ten low-income households.

Income/employment. The ten families in the study were all working class or poor.[3] The working class Southchester families included six with the following employment profiles:

Allain	father a clerk in a city welfare office; mother not employed
Coleman	father a postal service worker; mother not employed
Moreno	father occupation unknown; mother home with baby
Miro	father a restaurant worker; mother at home
Munoz	father works in bodega, fixes computers; mother in school
Romero	father runs three small restaurants; mother not employed

A borderline case is that of the Cabrera family in Southchester, where the father was a regional office manager for social service agency, a position with substantial managerial

[3] In arriving at class designations for the families in the study I have followed Lareau (2003) who categorizes as follows. Middle class children live in households where at least one parent is employed in a position that either a) entails substantial managerial authority; or b) that draws on highly complex, educationally-certified (i.e., college-level) skills. In my sample this included all 10 of the Elmhurst families. Working class children live in households where neither parent is employed in a middle class position, and at least one parent has a job that does not entail managerial authority and does not draw on college-level skills. This includes lower-level white-collar workers. In my sample this included 7 of the 10 Southchester families. Poor Children live in households where parents receive public assistance and do not participate in the labor force on a regular, continuous basis. In my sample this included the remaining 3 Southchester families.

authority. However, because the Cabreras were divorced, the children saw their father every other week on average, and Mrs. Cabrera was largely a single parent who relied on child support payments and part-time work as a translator to raise the children, we classified the Cabreras as a working-class family, bringing the total number of working class families to seven.

In the remaining three Southchester households parents received public assistance and did not participate in the labor force on a regular, continuous basis. Classified as 'poor', these families had the following employment profiles:

Broyard	Mother on workfare; father provides occasional financial assistance
Castillo	Single mother on public assistance; father intermittently supporting
Sherman	Single mother on public assistance with part-time work in a nail salon; father(s) minimally- or non-supporting.

Housing/Neighborhood safety. Southchester is a collection of New York City neighborhoods legendary for their poverty, crime and poor housing conditions. In fact, like much of New York City, the housing and crime patterns vary greatly, sometimes street by street. The families in the study lived in a variety of housing conditions, varying from tall, uninviting housing projects to the tree-lined streets of the Kensington section, with 2 and 3-family homes. Three families lived in public housing, five were in rented apartments or duplexes, and two were in self-owned homes. Nevertheless, families almost uniformly perceived and experienced their neighborhoods as unsafe for themselves and their children. During the course of the study violence occurred in two of the buildings where participating families lived, and in one instance the father of a child in the study sustained a knife wound. Parents' fears for safety meant that children were often discouraged or prohibited from playing outside. Similarly, adults and children said they limited their social activities with neighbors or their use of community resources due to fears about safety.

Education. As Table 2.1 summarizes, most adults in these Southchester families had a high school education or below. In four of the immigrant-headed households, parents had between a few months to 9 years of schooling. However, of the ten mothers, five were either currently taking classes at a local Community College, or had taken some college classes before. In the six families where fathers were present, the fathers

generally reported a comparable level of education. However, in one family, the father held an MBA degree.

Race/ethnicity. All families were of color. The majority were immigrants and did not speak English as the primary language in their homes. Three of the families were of Puerto Rican descent, two were Mexican-American, and two were from the Dominican Republic. Of the remaining families, two were African-American and one was African (Nigerian). In six of the ten families, Spanish was the primary language spoken between parents and children at home. In four of the families, English was the primary language spoken at home.

Family types. The ten families who took part in our study represent three different family structures and a total of eighteen parents. Six are two-parent families; three are single-parent families; and one is a divorced family in which custody of the children is shared between the mother and father. The number of children in each family ranges from two to five, with an average of three per family.

Schools attended by the TAA children. The focus of this study was children's computer use at home; logistic constraints did not permit us to collect data directly from the children's schools. TAA and the families themselves, however, were able to provide us with some information about ASE and PAC. (For information about these two schools, see Appendix 1.) Eight of the students in this study attended ASE, and two attended PAC.

Family	Place of Birth		Primary Lang		Educational Level		Employment		NOTES
	Mother	Father	Moth	Father	Mother	Father	Mother	Father	
Allain, Charles 3 brothers in grades 8, 3, and 1	Nigeria	Nigeria (1980)	Eng	Eng	HS, now in college for nursing	MBA (1985)	None; was para-profess. at local sch.	City child welfare office	
Broyard, Sonya Jennifer, 17 Tamira, 16 Tonya, 13	Southchester (PR descent) Single Mother	N/A Divorced	Eng / Sp	N/A	12th grade, no grad.	Unknown	Workfare (formerly on welfare)	Not living there – but provides occ fin. assist	
Castillo, Dina Sisters 24 and 17 Niece 7, Nurse	Harlem	N/A	Spanish	N/A	3rd grade	N/A	Pub Asst	N/A	Single mother, ill sister. Stressed, chaotic household
Coleman Amara Derek, 12	NYC (African Amer)	N. York (1st gen Jamaican)	Eng	Eng	Some college	High school, Training classes	Unemployed, used to wk for phone co.	Postal Service wkr.	Live in slightly nicer area of Southchester; residential block of 2-3 story buildings.
Cabrera, Luz Rubia, 4	PR Single Mother	PR (90) Divorced	Eng/S	Eng/S	1 yr university	BA poli-sci	Pt-time Translator	AARP found director	Both parents had a rough time in PR growing up. Want L. to avoid this.
Moreno Carlita Miguel, 13 Jose, 2	Domin Repub.	Domin Repub	Spanish	Spanish	3 yrs univ in DR; + CC classes	High school	Stays at home w/ baby	Unknown	
Miro Ernesto Alberto, 15 Eva, 11 Nadia, 4	Mex. (15 years)	Mexico (15 yrs)	Spanish; Taking English	Spanish, Some English	6th grade	9th grade	Home-maker	Restaurant worker	From small rural town in Mexico, bring little education Church is main social network.
Munoz Alicia James, 7	Domin Repub (8yrs)	Domin Repub (8 yrs)	Spanish, Some English	Spanish	High sch; but now getting AA	High school	None – Full-time AA student	Works in bodega; also fixes computers	Munoz's were middle class Dominicans. Father's job in bodega connects him to wide social network.
Romero Juan Igor, 14 Carla, 11	Mex	Mexico (15 yrs)	Spanish	Spanish	A few months	4 yrs primary	None	Owner of 3 small restau	Immigrant cultivators
Sherman, Jules Janine, 15 Jevon,	NYC (African Amer)	New Jers	Eng	Eng	Some BCC classes	High School	Public assist.	Handyman	Father not living with fam, but involved.

Table 2.1: Demographics of Southchester Families

Leisure and media use. The ASE students in the study spent relatively less leisure time at home because their school day extended from before 8am to 5pm Monday through Thursday, and until 3pm on Fridays. Students also attended classes on some Saturday mornings. Such hours are unusual for public schools. In comparison, the two PAC students in the study had a large amount of leisure time because, like most public schools, their school day extended only until 2:30 pm.

Grade levels of children studied. Seven of the ten students were in seventh grade at the time of the study; three were in eighth grade. According to data gathered by TAA researchers from the students' teachers, three of the students were in the high academic track, five in the middle track, and two in the low track. There are six girls and four boys in the TAA study sample. Two of these students have younger siblings, four have older siblings, and four children have both older and younger siblings.

Technology at home. All ten of the working class and poor families participating in this study received from TAA a Pentium-level computer with CD-ROM drive, floppy drive, and 56kb modem. The TAA computers were outfitted with the MS Windows 98 operating system; MS Office 2000; and CyberSitter 2000 (an Internet filtering program). The computers also came preprogrammed with Internet Explorer and a set of 112 educational "bookmarks." The families received email accounts through TAA's email server or through *eChalk* (a provider of web-based email solutions to schools). In addition, TAA had a tailored website, Community Corner (www.communitycorner.org), which was the homepage on all new computers distributed during the study year. In addition, these families received software such as AOL Instant Messenger; Adobe Acrobat Reader, as well as ACCU-type (a free typing program).

Internet connectivity. In the 2000–2001 academic year (the year TAA worked with ASE), TAA provided families with unlimited Internet service from a local Internet Service Provider (ISP) at a reduced rate of $8.95 per month. TAA paid for the first three months of access, after which time, families were given the choice to either continue paying for the ISP themselves or to switch to another provider. In the 2001–2002

academic year (the year TAA worked with PAC), TAA provided families with a free, advertising-supported ISP that had not been available earlier. Most TAA families had only one phone line at home. When a family was connected to the Internet, they were unable to make or receive phone calls.

Formal computer training. TAA provided all children and their parents with three and a half hours of basic computer training. This training gives the mostly novice users familiarity with:

- Assembling computer hardware (and knowing what each component does)
- Using the Windows operating system (e.g., mousing, clicking, file management)
- Using MS Word (e.g., creating, formatting, and saving word processing documents)
- Connecting to the Internet using a modem
- Sending and receiving e-mail
- Browsing the web
- Configuring the Internet filter.

The Elmhurst Families and Their Children

We studied ten families from suburban Elmhurst, New Jersey, a small, racially and socio-economically mixed residential suburb located 35 miles from New York City.

Income/Employment. The ten Elmhurst families can all be characterized as middle class, meaning that at least one parent is employed in a position that either a) entails substantial managerial authority; or b) that draws on highly complex, educationally-certified (i.e., college-level) skills. The occupations in these families reflect both Elmhurst's proximity to New York City, with its thriving financial and culture/media industries, but also a town emphasis on education and social responsibility: fully half of the households have an adult who works at least part-time in a school, as a teacher or an aide. Table 2.2 summarizes the demographics of the Elmhurst cohort. Occupations are also summarized here:

Christian	father a writer; mother a part-time school aide
Fleischer	step-father a teacher; mother a medical secretary
Gillette	father a construction manager; mother a commercial designer
Griffin	father N/A; mother a tax accountant
Logan	father deceased; mother an elementary school teacher
Mitchell	father an ad executive; mother a part-time substitute teacher
Prince	father a handyman; mother a customer service manager

Smithson	father a bank manager; mother a legal secretary
Verderame	father runs a media production co; mother a food writer
Wagner	father a painter; step-father has sm. bus.; mother a teacher

The working parents in these families work long hours at their jobs in order to support their middle-class lifestyles (and the town's high taxes). Fifteen of a total 18 parents work full-time, in jobs that include clerical and service jobs such as records administrator and customer service representative and, on the higher-paying end, small businessman, partner in an ad firm, and owner of a media production company. There are four full- and part-time school teachers in the group. Three of the women stayed home full time until recently to raise their children, and are now back in the work force. Two others work part time. Work involves significant commute time (over 1.5 hours) for at least one parent in over six of the families, usually the father.

Reflecting the contemporary blurring of workplace and home, many of these families have home offices, which function either as a secondary work site (e.g., where parents work at night or on days when they stay home) or a primary work site (e.g., the place from which parents run a small business).

Housing / Neighborhood Safety. Elmhurst families are comfortably middle-class by other standards as well. Physically, Elmhurst is a relatively safe community with little street crime. Developed in the 1920s and 30s, the town has a size and civic layout that encourages walking, and Elmhurst parents typically allow children to walk around town, to the park and to the movies, by themselves or with friends, by age 11 or 12. The town's attractions are few but compelling: a one-street 'downtown' with library, post office, stores, restaurants, an Internet café, and a family-owned movie theater. All but one of the families own their own homes. The houses themselves are attractive 3 and 4 bedroom colonials; their position relatively close to the street, on small lots, encourages neighborliness, and Elmhurst families tend to have many overlapping social networks. Taxes on the homes are high, and at the time of the study were increasing rapidly, and causing anxiety for many residents. Still, parents routinely paid for extra lessons,

Family	Ethnicity/Origin Mother	Father	Family Status	Educational Level Mother	Father	Employment Mother	Father	Notes
Christian, Julie Gemma, 9	African Amer.	African Amer	Married, two Children; mother just back in work force.	BA	BA	Pt time school aide	Magazine writer	Beginning or emergent user
Fleischer, Mark Karla, 14	White	White	Divorced and recently remarried	BA	BA	Medical secretary	Stepfather - 8th gr teacher	
Gillette, Dawn Ellie, 7	White	White - NY	Married, two children	MA	Some college	Commercial designer	Construction supervisor	
Griffin, Cole Mark, 10	Guyana (20 yrs) Black	African Amer	Divorced; single mother; Works from home office a lot.	MA	?	Tax Account-ant (consultant)	NA	Currently home-schooling her children
Logan, Carl Jordan, 8	White, NJ	Deceased	Father Deceased; single mother; back full time in workforce	BA	NA	3rd grade teacher	NA	
Mitchell, Rene Jenny, 9	White - NJ	White - NY	Married, two children;	BA	BA	Part-time substitute teacher	Executive in a advertising firm	Mother wks part time to be home with kids
Prince, Fiona Jared, 8	Jamaica (15 yrs) Black	Jamaica (15 yrs) Black	Married, two children	Some college	High School	Customer service manager	Handyman	Children often with neighbors and relatives who live nearby.
Smithson, Lucy Kevin Jr., 18 Sam, 15	White - NJ	White – NJ	Married, three children, one in college locally	BA	BA	Legal Secretary	Bank manager	
Verderame Tucker Chrissy, 8	White NJ	White NY	Married, but getting divorced; two children.	BA	BA	Food and Nutrition writer	Runs a media production company	
Wagner, Ellen Bill, 16	White, NY	England White	Divorced and recently remarried, Linda and	BA	Some college	1st grade teacher at pvt school	Step Father – has house painting business	Father in England is a painter; kids travel to see him yearly

Table 2.2: Demographics of Elmhurst Families

computer upgrades, and vacations that enrich their children's lives, even if for some these are a financial stretch.

Education. Elmhurst families have educational advantages as well: most parents have college degrees or higher, and all have at least some college. In addition, family size is small (most have only two children), enabling parents to attend to children more closely than in larger families.

Race/ethnicity. The ten families in the study are racially diverse, reflecting Elmhurst's general racial mixture and tolerance. Six of ten are Caucasian, three are African American, and one family has parents of different races (by second marriage). Most families are American citizens born in this country; but one of the African-American families emigrated from Jamaica fourteen years before, and another family moved from England four years earlier.

Family types. Five of the ten families we studied were intact first marriages in which children lived with both parents. Two were single-parent families (one due to death, one to divorce); two more were second marriages in which the children lived with a stepparent; and in one family the parents were separating as the study occurred.

Leisure and media use. A consequence of parental work patterns in these families is that the children spend a large amount of unsupervised time at home, especially in the hours between 3:00 and 7:00pm. A large amount of this time at home, up to four or five hours a day, is spent with media, including television, videogames, and the computer/Internet. In short, home is where the media are.

The children studied. We studied six girls and four boys in these families. Five are in the highest academic track in their middle school, which means that they scored well on standardized tests and are bound for AP-level courses in the high school. Four are in the middle track, in which courses are not as intellectually demanding, though homework still can be heavy. None is in the lowest, or remedial, track. One parent is home-schooling her children. Most children have only one other sibling; four have an older

sibling and six have younger siblings. Many, though not all, pursue hobbies and interests outside of school — music lessons, sports, drama, cheerleading, chorus; however, each student's intensity of involvement in these activities varies greatly and many have a good deal of leisure time, much of it unmonitored.

Technology at home. Two features of the computing environment in these households stand out: the great accessibility of networked computers and the continuous investments made in computing. First, six of ten families have two or more working computers at home (two families have three, and two families have four). Nearly all families (nine of ten) have at least one powerful Pentium machine bought in the last three years. Families typically designate their most powerful networked machine the "family computer" and put it in a shared space such as living room, den, or guest room. Families with multiple computers typically regard the others as belonging to a parent (e.g., "dad's laptop," used for work), and/or as "the old computer," which they often put in a child's bedroom or basement, where it is used for games. For the most part, computers and the Internet are not recent arrivals in these households. Seven of ten families have had a computer for more than five years, and nine of ten have had Internet access for at least two years. Families pay an average of $30 dollars a month for Internet service, usually through America Online (AOL). One family has broadband network access through a cable modem. More than half the families have separate telephone lines for their Internet-connected computers, enabling family members to use the phone and the Internet at the same time. As a result, eight of ten of these families had fairly robust and stable computer and Internet access during the period of the study.

Parents in these families continually invest in technology, for their children as well as themselves: they shop for upgrades to new machines (three families had upgraded to powerful multimedia computers in the six months prior to the research, and one bought a new computer during the research); they buy laser printers or scanners or digital cameras they think will add value to what they already have; they browse software racks in stores looking for titles that might be good for learning or for fun or for practical tasks. Some do not make these investments lightly, however, because for they may involve financial sacrifices.

Data Analysis

Data analysis examined differences *within* communities as well as *between* communities. For example, when it comes to computing, middle class families who are highly achievement-oriented may have less in common with their leisure-oriented suburban peers than they do with low-income immigrants who also value schooling. Conversely, the computing of children in middle and low income families who share a 'permissive' or 'uninvolved' parenting style may look a great deal more similar than those of their peers.

Data analysis began with the demographic mapping of the participating families, according to each family's housing conditions, immigration status, ethnicity/race, number of children; parents' profession, education, and experience with computers and Internet; the family's reading practices and TV-watching patterns; the location of the computer in the home; and the participating children's ages, academic track, and computer interest and use. These data formed the contextual backdrop for analyzing the interviews and observations with children and parents.

I analyzed the interview and observation data thematically using ATLAS/TI, coding software that helps make the analysis and interpretation of qualitative data more systematic. The analysis was pursued along two parallel thematic 'tracks', one concerned with the mapping of children's *digital literacy activities and skills*, and the other the *family contexts of computing*. In doing so I followed the general approach of grounded theory (Strauss & Corbin, 1990).

The child interviews, and the observations of children's computer use in the home, were analyzed along the following dimensions of digital skill: troubleshooting, purposes of computing, fluency with common tools, communications literacy, and web literacy.

> Troubleshooting. Troubleshooting literacy means being able to cope with the inevitable technical challenges that computer use involves – connectivity failures, missing files, software incompatibility, application crashes, memory limitations, problems with printers and modems. Fluency involves elements of knowledge (e.g.,

the relationship of applications and documents), attitude (e.g. the confidence and belief that a problem can be solved), and linguistic competence (e.g. the ability to describe the problem in language to someone else), since successful troubleshooting nearly always, at some point, requires the assistance of others such as telephone help lines or more competent relatives. Given the large number of technical problems that people have using home computers (Keisler et al., 2000), these are skills and habits that are seriously under appreciated in the literature on information technology.

Purposes. This dimension of literacy refers to the social and personal ends that computing serves. Purposes can be school-related, communicative, recreational, practical/informational, or income-related. On this dimension, greater fluency means greater *variety* of purposes: a child who uses the computer to work on school projects *and* chat with friends *and* help a parent find a phone number *and* play games is more fluent than one who uses the computer for only one activity.

Fluency with common tools. This dimension of digital literacy means using and knowing what to expect from standard or common software tools. These tools include a) the computer operating system (for file management, e.g.), b) a word processor, c) email, d) a spreadsheet or database, and e) programs for displaying graphics and audio files. Greater fluency with these tools means both more *differentiated* use — familiarity with a range of tools — and more *depth* in using any single tool. We define "depth" as using more than the routine or surface-level features of a program to achieve *individualized* or *personalized* results or effects. In using a word processor, for example, a child who varies font style, color, and formatting to achieve an effect in a poem is demonstrating greater fluency than a child who never varies formatting or whose font or color changes are aimless. In this way, fluency with tools is connected with the concept of *authorship* — using technology to put one's own stamp on the world.

Communications literacy. This refers to children's use of computer-mediated communication tools — email, instant messaging, chat, bulletin boards — for a range of purposes from recreation to work. Fluency in this dimension means being able to

mobilize features of these tools for differentiated ends. The child who uses email or Instant Messaging only for recreational text-based chatting, for example, is less literate than the child who also uses the file attachment feature to send and receive text or audio files (e.g., lost homework or a song they want a friend to hear), or who copies URLs into messages to help a friend/relative access a recommended website, or who creates online chat profiles that include no identifying information, in order to protect his/her own privacy.

Web literacy. This dimension of literacy refers largely to children's level of ability to find and interpret information and represent their own viewpoint within the complex and chaotic information environment of the web. Greater fluency here means more effective research or "information literacy" skills — more effectively using search engines to find information; taking a greater evaluative stance toward information (e.g., the commercial nature of much web material); and using a web browser's features to more effectively organize ("store" and retrieve) web material or make use of web material (e.g., cut and paste web information, cite it correctly). It also means understanding the limitations of the web as a medium, for example, in comparison to other media such as books, and the library. Finally, it means establishing more of a "voice" within the web medium — creating a web page, contributing one's views or artwork to an existing site, etc.

Family contexts. Data collected on the family contexts of computing activities – including parent interviews and observations of interactions among family members – were analyzed along four key dimensions: 1) the autonomy of children's computing; 2) the family's computing 'capital'; 3) parenting style and 4) academic supports.

The *autonomy of children's computing* refers to the extent of the child's freedom to use the computer in ways he or she wants to. I looked for evidence of the computer's location in the home and who has access to it; the privacy vs. the supervision afforded by this locale; the hours during which children have access; the presence or absence of household rules concerning computer use; and the use of any software filtering or parental controls on the child's computer.

Family computing 'capital' refers to the extent to which one or both parents and/or siblings posses computer knowledge and experience that is available to the child. As instances of computing capital I counted indications that parents or older siblings a) know about computers and the Internet from their own prior experience; b) helped choose or buy computer hardware and software; c) helped troubleshoot computer hardware or software problems, and/or drew on technical resources in the family's social network; d) modeled learning and use of the home computer (e.g., by themselves using it for paid work, entertainment, information-gathering); e) directly taught children to use computer or internet applications or programs; and f) talked to children about the computer and Internet as media, for example, the pros and cons of using it for different purposes. I also tried to identify the computing capital accessible to the family through its proximal social networks –extended family members, friends, neighbors, and nearby stores.

In analyzing *parenting styles,* I initially used Baumrind's (1991) typology of authoritarian, permissive, authoritative and uninvolved parenting styles. This typology classifies parenting as *authoritarian* when the data indicate high levels of demandingness (supervision, behavioral rules, confrontation and consequences for disobeying) and relatively little responsiveness (communicative 'tuning', efforts to foster self-assertion, awareness of and allowances for special needs of each child); parenting is 'permissive' when data indicate high levels of responsiveness, and relatively little demandingness; parenting is *authoritative* when data indicate high demandingness *and* high responsiveness; and parenting is classed as *uninvolved* when the data indicate both low demandingness *and* low responsiveness. While I found this typology useful for organizing a first and second pass through the data, I found that my observational data did not supply enough instances of clear parent-child interactions to warrant its use. Instead, I found more useful Lareau's (2003) interpretive scheme for analyzing middle and working class parenting in *Unequal Childhoods*. This scheme privileges categories of information that I possessed either from interviews or home observations, such as the organization of daily life (e.g., organizing and monitoring children's leisure activities in and out of the home), patterns of talk between children and parents, and interactions with

institutions (e.g., parents' communications with school, and with technical service providers).

Finally, connected to the theme of parenting style, I looked for evidence of parental *academic support*, including a) providing direct help with homework or checking it regularly; b) knowing details of the child's schooling (e.g., assignments, activities); c) having rules that support getting schoolwork done and monitoring homework; d) helping children learn to manage time and attention on multiple tasks; e) buying books, music, or other literacy resources or otherwise provided enriching cultural experiences for children; and f) having frequent discussions about school-related topics.

These four analytic lenses were used to understand how parenting practices and other supports vary across the families in both communities, and in particular, how they shaped and responded to what children were doing with the computer and Internet, and the level and types of literacy they displayed.

The environment of family computing in 2000-02

Several developments shaped the larger environment of family when this study was conducted between 2000 and early 2002, and providing important context for what children and families did with their home computers. The environment of family computing was shaped by technical, software, and socio-legal developments.

First, in the realm of technology, far more robust multimedia computers were becoming prevalent in many homes. Consumer-level computers during this period often came with fast multimedia processors, stereo speakers, digital camera inputs, outputs for color printers, and CD burners. For those who could afford it, better connectivity (e.g., the development of high-speed modem and DSL connections for consumers) made the 'pay-off' of online time dramatically better for home users.

Second, in the software realm, computer and software makers were eagerly exploiting this increased computing capacity by selling software for an expanded range of home computing activities. This period saw the increased dominance of AOL and its evolving

features in the consumer market – especially the rise of Instant Messaging, youth-oriented chat rooms and other communicative uses of the net. There was also rapid growth of multimedia content on the web. Photographs and video files on the web became more routine, as people were encouraged to create and share family photo albums, edit home movies, etc. The proliferation of sexually oriented commercial and free websites and chat-rooms was, as always, a feature of this landscape. Most characteristically, Napster became a cultural phenomenon during this period, as millions of Americans took part in downloading shared music files for free – much to the music industry's consternation.

Children's computing was shaped by an increase in youth-oriented websites, both commercial and non-commercial. On the commercial side, there were intensified efforts to attract a youth market via advertising and product sales, often linked to licensed media properties (e.g. Disney, American Girl, Nickelodeon, and innumerable TV shows and Hollywood movies). There was also an increase in the number of pro-social websites for young people and girls, created and funded by non-profit, governmental and educational groups to promote healthier activities by young people. In response to adult concerns about the prevalence of pornography and the possibility of child exploitation online, this period also gave rise to public and governmental 'push-back,' in laws said to protect children from potential abuses, such as the Telecommunications Act and the Children's Online Privacy Act. Meanwhile, fearful that too much government intervention of this sort might be bad for business, Internet providers strongly promoted 'parental control' software during this period – software that was supposed to allow parents to exercise control over the content and the increasing amounts of time children were spending online.

The socio-economic and legal environment of family computing was shaped by two additional broad factors. First, widespread techno-enthusiasm was a feature of this period. The American economy had reached a peak of growth, largely driven, it was believed, by new technologies and their productivity benefits. At the same time, there was a stock market mania for 'dot-coms,' entrepreneurial start-up companies financed

lavishly by investors confident they would benefit from a tectonic social shift toward e-commerce (generally despite the companies' continued unprofitability). Second, paralleling this enthusiasm for technologies were worries that the benefits of the information revolution would not be equally shared. Coming at the end of the second Clinton/ Gore administration, this study coincided with a peak of public concern over the 'digital divide' – persistent inequities in computer and online access based on factors of income, education, race and ethnicity. As we have noted, this gave rise to many efforts to make technologies more accessible to urban and minority families and youth, via law (the E-Rate Program for schools and libraries), community volunteerism (Net Days) and through corporate and foundation wiring efforts of homes (e.g., TAA's program for urban youth).[4]

It is in the context of these broader developments that the portraits of children's computing sketched in Chapter Three arise.

[4] It is also important to consider the digital media developments that had NOT occurred when this study was conducted. Several important things that have happened since the end of the study include: a) the growth of high-speed cable modem and DSL connections into homes (the consequence is more content can be pumped into homes more easily); b) the growth of wireless computing, which is of particular consequence for patterns of work and leisure at home, since computers can now be moved with much more freedom around the house; c) cell phones becoming ubiquitous; d) webcams and weblogs (or 'blogs' becoming more common in communications; e) the growth of hand-held computing, PDAs, and blackberries that enable professionals to schedule, customize, and communicate about their time and tasks with greater facility; f) the emergence of more portable music players such as the I-Pod, which enables digital music to become more rationalized and kid-accessible; g) the increase in video- and graphics-intensive web materials, including streaming movies, trailers, and downloadable or sharable movies.

Chapter Three

Children's Computing in Middle and Working Class Homes

> The upstairs 'computer room' in the Wagner house in Elmhurst is a small, comfortable room cluttered with cat boxes and extra litter, a couch, an exercise machine, and books on shelves around the room: fiction, history, mystery novels. Immediately on the left as you enter sits a modern desk unit strongly illuminated by a floor lamp. It holds the computer monitor and keyboard, which are stacked above the computer and printer hidden beneath. You can't see the screen from the doorway or the hallway, but if you take two steps into the room and turn around, you can see it. The desk unit with computer is the focus of the room. Ellen, a lanky 12-year-old in jeans and a t-shirt, slides easily into her seat at the computer, in a comfortable office chair, one leg tucked under her. While her mother stands in the doorway taking with me, Ellen quickly and quietly opens and moves between several different programs – (maybe partly for my benefit): She Instant Messages with a friend, asking when a homework assignment is due (later I learn that it a stock market simulation based on web data on real stocks); she goes to bored.com, and finds a doll dress-up activity she plays for a while; she opens Napster and plays a song she has downloaded; she shows me a graphic of a unicorn she made in a one-week course for girls she took at a local internet cafe.
>
> [Fieldnote]

> In the Coleman home in Southchester, the TAA computer is positioned in the corner of the kitchen table. The visit took place in the kitchen, while Amara's mother was cooking dinner. The kitchen table does double and triple duty – as a place for eating, for doing homework, and more rarely, for using the computer. Amara, 13, says she uses this computer maybe once a week, for typing and sometimes CD-ROM games. She turns it on and shows us some of the book reports she types for school. "They give us extra points if we type our reports," she says. She shows us CDs that include Barbie, Mob Blaster, and Mavis Beacon, a typing program. This computer is not connected to the Internet, and has no printer attached. Amara explains that they tried to install KMart's "Blue-light Internet," but it didn't work. Because of this, Amara goes upstairs and uses her grandmother's computer about once a week to type, to do web searches, and to print. Amara's grandmother, mother, or twin brother Derek are often with her in the kitchen when she is using the computer. Her mother is proud of her computer use. "In our house Mani's the quickest at typing, cause she uses [the computer] more than the rest of us." But Amara says she uses the TAA computer once or twice a week at most.
>
> [Fieldnote]

These two portraits illustrate some of the broad differences between children's computing in Elmhurst and Southchester. Children in Elmhurst used the computer access they had much more extensively, and for a wider range of uses than did children in Southchester.

They also appeared to be gaining a wider set of computer-related literacies than did their counterparts in Southchester – literacies that could well translate into advantages in institutional settings of school and work. At the same time, Southchester children used their home computers in ways that were less solitary and isolated than their Elmhurst peers. They often helped their parents and siblings with computer-related tasks, and worked more cooperatively with the medium than did their suburban counterparts.

This chapter and the next describe patterns in children's computing, and how they are rooted in the economic, social and educational circumstances of the two communities, sometimes in ways that reinforce these inequalities, and sometimes in ways that may modify them. Elmhurst children enjoyed both more access to computers and the Internet than their Southchester counterparts, and higher quality access. This access sometimes translated into increased opportunities for enriching uses, and sometimes into long periods of unproductive time that children recognized their parents would not approve of. In Southchester, smaller, more crowded homes meant that computers were usually kept in shared spaces like living rooms and dining rooms and were therefore more of a shared resource, less often used by children in isolation. Families' ethnic and cultural traditions, a stronger presence in Southchester than in Elmhurst, also influenced computer uses, as in some families, children and adults worked together on flyers for Church and activities like finding Spanish-language news and translating official documents. The character of the neighborhood and community also played direct and indirect roles in children's computing. In Elmhurst, children were able to take advantage of good library access and an Internet Café that offered courses for children, such as one that helped girls gain confidence with computers. In Southchester, the computer was used as an information reference by children partly because parents were reluctant to let children travel to the traditional reference source, the local library, due to well-founded fears about neighborhood safety. It was also used by some youngsters as an 'escape' from oppressive household circumstances.

Children's Computing in Southchester and Elmhurst

Table 3.1 summarizes several of the broad differences between computer use by Elmhurst and Southchester children.

Table 3.1: Broad Differences in Children's Home Computing

Elmhurst Children	Southchester Children
Use home computer and internet for an hour and a half a day on average	Use home computer and internet less than an hour a day on average
Use broad range of applications; Recreational uses lead school-related uses.	Use narrow range of applications, mostly word processing and simple computer games. School-related uses lead recreational uses.
Tend to trouble-shoot problems with confidence, either on their own or drawing on help of others close by.	Have to trouble-shoot problems without much help or experience; often don't succeed.
Often demonstrate information skills in using computer.	Most often demonstrate functional skills in using computer.
Have a vocabulary for talking about the computer as a medium.	Lack a vocabulary for talking about the computer as a medium.
Mostly use computer alone; sometimes with peers.	Mostly use computers with family members around; help other family members.
Experience conflict with siblings and parents over computer use.	Experience little conflict with siblings and parents around computer use.

A. Differences in Time Spent on Home Computers

Mark Fleischer, 12, gets home from middle school at 3:15pm, a few minutes before his sister arrives from high school, and he goes straight to the computer to get online before she can. Today his friend Todd has come home with him, and sitting together at the computer table in the living room, they pull up a website Mark maintains called 'EMS Sucks,' a bulletin board where kids can post gossip about their school. Mark brings out a bag of potato chips and milk and some leftover chocolate candy. They read the new postings from over the weekend, mostly messages from users with names like 'muthafreaker' and 'girlyfox89' about how bad last Friday's 'Canteen' social for 7th graders was, and they add several of their own. In the twenty minutes this has occupied, Mark has had 5 or 6 Instant Messages pop up his screen. He's typed back to all of them the word "Busy" and gone back to his website. But now he tells Todd, "Let's see who's on – there should be a lot, it's after 3:30." They find 17 'buddies' online, boys and girls who, like Mark and Todd, have gone home and quickly gone on AOL Instant Messenger. Mark and Todd spend the next hour and twenty minutes Instant Messaging with friends from school, gossiping with both girls and boys about friends and teachers, who is going out with who, what teacher 'freaked out' and

> assigned too much homework. In between messages they do other things – look on Napster for a song mentioned by a friend and download and play it, go to NeoPets.com to see how Todd's pets are doing, visit the 'EMS Sucks' site again, and go to the WWF (World Wrestling Federation) site to find out who will be featured on tonight's match on TV. At 5:00pm Mark's sister comes downstairs and argues with him to get off the computer, and Mark finally relents. Todd goes home, and Mark looks dejectedly through his school bag at his homework assignments, then turns on the TV and switches between Nickelodeon, MTV and a nature show for 45 minutes, while talking to the researcher. By 6:00 pm Mark's mother is home and while she talks and prepares dinner, Mark continues watching TV, occasionally joining in the conversation. At 6:15, when Mark's sister leaves the computer, Mark goes back to it, checks his email, and IMs briefly with a couple of friends. Only after his mother has called him 3 times does Mark leave the computer and come to the dinner table. Mark says that after dinner he'll spend another two hours online, doing his homework and chatting at the same time, before he goes to bed at 10:30 or 11:00pm. His mother says "at least." When the researcher asks if 4 hours a day on the computer is pretty typical for Mark, both he and his mother reply without hesitating, "Yep." "Well – Three or four hours," says Mark.

For Mark, like most of the Elmhurst children in this study, the computer and Internet are technologies that are well woven into day-to-day life. Mark uses the computer 3 to 4 hours a day, in ways that feel central to his evolving identity as a popular 7th grade male. He has fluent command of a range of applications – not just word processing, but also Excel, Instant Messenger, webpage authoring tools, and web forums that enable him to get homework help and share information with others. While at the extreme end of the spectrum in terms of hours of use, Mark is typical of Elmhurst children in his relatively *robust* use of the medium. His uses are largely recreational, but they involve a wide range of tools and a wide range of judgments in using them.

This contrasts markedly with most of the Southchester children, for whom the computer is far more peripheral as an element of their home lives.

> Sonya Broyard, 11, arrives home from school at 6:00pm, tired. As on most days, Sonya has already done much of her homework in the extended-day program at her school, Southchester's Academy for Scholastic Excellence. Today she used an ASE computer to type her reactions to a story she had read for English (she didn't save the file she typed – just printed it out for the next day). As she enters her apartment Sonya drops her book bag on the floor and drops herself onto the sofa. While a visitor greets her mother, Sonya watches the large-screen TV opposite the couch; it is showing a game show her mother has been half-watching from the kitchen. Sonya's older sister Jennifer, 17, gets up and leaves the room without saying anything; before Sonya arrived home she had been using the computer on a table next to the TV. "Jennifer likes to go on chat rooms, but

> she don't like us around when she's doing it," Sonya explains. "She and [my sister] Tonya use the computer more than me. They showed me how to get onto a chat room, and I tried it. But I don't go there much." While a visitor talks to her mother, Sonya goes to her bedroom and finds one of her older sisters watching a sitcom (all three bedrooms have TVs). It's a re-run she has already seen, so she returns to the living room. Asked about the computer she says "The computer they gave us doesn't work good… I only play games on it." To demonstrate she sits down and clicks to a list of games that are standard on a PC. "These are my favorites - I like Solitaire the most, then Free Cell, and Hearts. I do really good on Hangman, cause I know my states really good from social studies. But I only go on this [computer] once or twice a week."

For Sonya Broyard, like many of her Southchester peers, the computer is a peripheral part of day-to-day life at home. Sonya uses her home computer for an hour or two at most each week, and only to play common computer games. She uses computers at school more – for typing and occasionally email – but at home her interest in and use of the computer is constrained by a long school day, older sisters who tend to monopolize it, and inconsistent Internet connectivity that makes it unreliable. Like several of the Southchester children, Sonya is what can be called a 'thin' user of her home computer. Her leisure routines are dominated by more traditional commercial media – music, movies and especially the TV. These media dominate her parents' and her siblings' leisure time, as well as hers. Yet while her older sisters spend hours each week chatting online in addition to watching TV watching, Sonya is largely content to watch TV in her bedroom, talk on the telephone, look at magazines and listen to music. At school her uses are what might be termed 'scribal' – mainly typing homework assignments; and at home they are narrowly recreational – focused on games. Beyond the narrow range of standard games like Solitaire, computing is an activity she does at school, not at home.

Tables 3.2 and 3.3 contrast the time spent in home computing by children in Southchester and Elmhurst.

Table 3.2: Access, Sibling Competition, and Computer Time in Southchester

Subject	Working computers in home	Siblings sharing computer(s)	Weekly time spent on home computer	Internet access during study
Sonya Broyard	1	2	1-2 hours	Intermittent
Amara Coleman	2	1	3.5 hours	Steady
Carlita Moreno	1	1	4-5 hours	Intermittent
Charles Allain	1	3	5 hours	Intermittent
Ernesto Miro	1	3	5 hours	Steady
Juan Romero	2	2	5.5 hours	Steady
Alicia Munoz	1	1	8 hours	Intermittent
Jules Sherman	1	2	8-10 hours	Intermittent
Luz Cabrera	1	1	10-14 hours	Steady
Dina Castillo	1	2	14-18 hours	Steady

Table 3.3: Access, Sibling Competition, and Computer Time in Elmhurst

Subject	Working computers in home	Siblings sharing computer(s)	Weekly time spent on home computer	Internet access during study
Julie Christian	1	1	3.5 hours	Steady
Fiona Prince	1	1	5-6 hours	Steady
Carl Logan	1	1	7 hours	Intermittent
Tucker Verderame	3	1	10-12 hours	Steady
Dawn Gillette	4	1	10-12 hours	Steady
Rene Mitchell	3	1	10-14 hours	Steady
Ellen Wagner	3	1	12-14 hours	Steady
Lucy Smithson	2	1	14-16 hours	Steady
Cole Griffin	1	1	18-20 hours	Steady
Mark Fleischer	1	1	21 hours	Steady

The Elmhurst children we studied spent an average of 10.5 hours a week on the computer and Internet, equivalent to an hour and half per day, seven days a week. This is fifty percent more time on the computer than the Southchester children, who spent slightly less than an hour a day on it, on average. At least in part, the more robust use of the medium by Elmhurst children is explained by differences in practical access. As the Tables show, Elmhurst children had more computers in their homes, had to share them with fewer siblings, and enjoyed steadier Internet access in using their computer.[5]

However, as the Tables also show, within each community there is significant variation in the time children spend on home computers. A third of the Southchester cohort used their computers for over 12 hours a week on average, while the other two-thirds used them only 5 hours a week or less, on average. In Elmhurst these proportions were reversed: Three children used their home computers for about 5 hours a week on average; while seven used them for an average of 14.5 hours a week, or the equivalent of more than two hours each day. (These differences will be discussed further in Chapters Four and Six.)

[5] In this study we wove questions about time in gradually, as we probed children's uses. We examined time iteratively, and from multiple angles. First we asked children to make a list of everything they did with their computers at home. Then we asked them to draw a pie chart representing all the time they spent on the computer at home, and to show us how big a 'slice' of the pie each activity got (see Appendix for an example). Many children spontaneously assigned times (minutes or hours per day or week) to each activity; if not, we asked them to do so. Finally, we asked them to roughly guess how much total time per week or day they spent on their home computers. (We checked their estimates against parents' estimates, which corresponded to a remarkable degree.) The pie chart task proved to be a useful way to help children to think and talk more concretely and comparatively about their computer-related activities, who they did them with, and where. In the context of the interviews the pie charts served as aids to children's talk, more than a means of getting accurate time estimates. Nevertheless, many children spontaneously revised their pie slices and their time estimates as they went. In a limited way, our follow up observations and semi-structured tasks such as the 'tour' of their computer that children gave us served as rough checks on the relative weight they gave to each activity (For example, if a child said they spent 1-2 hours a day Instant Messaging with a large group of friends, we expected to see a Buddy List that contained many active 'buddies', stored messages from them, etc.; if not, we considered their time estimate for that activity an over-statement.) Regardless, it is still best to treat children's time reports cautiously; they offer more reliable information about the *relative weights* of children's different computer activities than they do about the absolute time spent doing these.

As we see in the next section, children in the two communities used the time they did spend on their home computers in contrasting ways, as well.

B. The Content of Children's Computing in Working and Middle Class Homes: Narrow School-focused Users vs. Broad Recreational Users

Southchester and Elmhurst children used their home computers in many similar ways. All children pursued a mix of school-related and recreational uses, chief among them typing homework and playing computer games. In addition, nearly all pursued age-related interests in popular media, including looking for information and pictures about favorite bands, songs, movies and TV shows, actors and actresses, and sports celebrities.

Looked at broadly, however, several significant differences in the content of children's computing emerged. Southchester children's computing tended to conform to a general pattern characterized by: 1) use of a narrow range of applications, with relatively little use of the Internet; 2) an emphasis on school-related uses – chiefly typing assignments for school –followed by recreational uses; and 3) for some children, informational tasks that helped themselves or their family members get needed practical information. Elmhurst children's computing, in contrast, was most often characterized by 1) use of a broad range of applications in which the Internet was prominent; 2) an emphasis on recreational uses (especially communication with peers via Instant Messenger) in comparison with school-related uses; and 3) active 'consumer' uses of the medium for tasks such as downloading music files, scanning images, and using digital cameras. This chapter describes these differences in more detail.

1. Southchester Children as Narrow Users: Typists, Game Players and Info-Seekers

The Southchester children can be characterized as beginning, or emergent, users of the digital medium. Among six of nine Southchester families (Allain, Coleman, Moreno, Miro, Broyard, Romero) there is a history of computer ownership and use, but not a great deal of experience with the medium in its different genres. Children are not big users of

the Internet yet, in particular. The Internet is mostly new to them, even if they've had a computer for some time. Most engage in little communication beyond occasional emails to friends. Some visit chat rooms for fun occasionally, or are beginning to explore Instant Messaging, but these do not yet constitute a significant part of their leisure time. Rather, schoolwork and game playing occupy most of their home computing time. There are two patterns: Over half mostly pursue basic school-related activities, and also play games offline and on; the others mostly pursue games and browsing, and do a little bit of school-related work. All are dealing with a variety of access challenges that will be explored below.

1a. School-related computing by working class children:

"It's mainly like a typewriter."

For more than half of the Southchester children in the study the leading use of their computer is to complete schoolwork. Typing homework using word processing software constitutes the largest category of school-related use. Children report typing up science experiments, book reports, essays on literature, language-arts writing contests, social studies projects, and math problems.

> Amara, 13: Well, I usually use [the computer] for homework. We had to do social studies book reports. If you type your book report on the computer, you get ten extra points on your grade. That's the reason I like to go on the computer. For instance, you get ganas, it's like extra credit, if you do something on the computer, you type it or something, that's what I really like about the computer.

> Amar, 13: I write my papers with the computer. I did a project on the Oregon Trail. We typed the text and printed it, we had a poster board and we had a map.

> Ernesto, 12: We also have every month, we have a contest, a writing contest. We have to do it in our class. And they want it typed, so we have to type it.

Their school-related activities also include, to a lesser extent, searching the web for answers to questions posed by their teachers, and searching for information on CD-ROM reference discs, like Encarta.

> Amara, 13: In social studies, I use it [the Internet] to answer

> questions like 'which person made this machine at this year?'
>
> Juan, 12: [The computer and Internet] is like a mine. You can dig and store information. It makes me more independent. It develops my mind. It's useful to get information to do my homework.

Working class parents were pleased about their children's use of the computer to do schoolwork; this conformed to their understanding of what the computer was for. Amara's mother, like several others, commented that she liked her daughter to use the spell checker and thesaurus in the computer while writing her school papers, because it "adds variety to her writing, to her language."

Another parent approved of the aesthetics involved in using word processors to change font sizes, styles and colors.

> [My daughter] uses the computer to type all of her science reports, which are so nice: the color catches you, the different captioning, the different headlines, the different decorations. She did all kinds of frames using the computer.

The following portrait of Amara Coleman indicates both the relatively limited role of the computer in the lives of these working class children, and the limited use of the medium for mostly school-related purposes of typing assignments.

Amara Coleman: Portrait of a Typist

Amara Coleman is a slightly-built 12-year-old in the 7th grade, but she cuts a large figure in her household, one that always seems to be moving. In conversation, she tends to overshadow her twin brother Derek, the only other sibling at home. **"**Amara is almost two hours older than her brother," says her mother. "They were two months early, because she was ready to come into the world and start being Amara." At this Amara laughs and sings: "I'm comin' out… I want the world to know, got to let it show..."

The Colemans live in a three-story building in the Castle Hill section of Southchester, on a street that is nicer than many of the surrounding streets. With its rows of brick and

sandstone houses, and leafy trees, the street feels a bit like an urban oasis. The house is owned by the Colemans, who inherited it from Mr. Coleman's father, an immigrant from Jamaica. Both of Amara's parents are African Americans born in New York. Mr. Coleman works for a telecommunications company as a line technician; Mrs. Coleman worked there for several years when the children were very young. For the past 8 years she has been caring for Amara and Derek full-time, and has recently been trying to figure out how to re-enter the workforce. Both parents have high school degrees, but Mr. Coleman has additional technical training and Mrs. Coleman has taken several courses at Southchester Community College. Along with one other family in Southchester, the Colemans push the definition of 'working class' toward a classification as 'middle class.'

Amara is an honors student at the Academy for Scholastic Excellence, and is in the gifted program, while her brother is in the regular track. She cares a lot about doing well in school, and it doesn't appear too difficult for her to do so. "I do my homework at school when I can – which is most of the time," she says. "Sometimes I have projects at home, or typing to do, but not that much."

"Everything comes easy to Amara, and it always has," says her mother. "She just kind of takes for granted that everybody should be like that." In addition to doing well in school, Amara and her brother both play instruments – Amara the viola and Derek the drums -- and have athletic interests as well, Amara in dance and Derek in basketball. They also sing in the church choir; Julia takes her children to church every other week in a New York suburb.

The computer is one of the things that comes easily to Amara. "I'm better at it than my brother is," she says. "I can just figure out how it works. He gets frustrated too easily." Julia, Amara's mother, concurs: "In our house Mara's the quickest at typing, 'cause she uses [the computer] more than the rest of us. … But she's a little bit intolerant with people that don't get things as quickly as she does. She doesn't help her brother. When

he hits a block, he'll call Amara, and she's like, 'Well you should know how to do that by now, no, no, I'm busy, I'm not doing that, you should know how to do that."

Amara's favorite pastime at home is watching television. Because of their long school day and the other activities they're involved in, Amara and her brother don't have a lot of 'down time.' Still, on weeknights after her homework is done, Amara likes to spend the time before bed watching TV in her room, or hanging out and listening to music with a girlfriend who lives in the building, or reading, alone. "I read a lot," she says, magazines, like *Cosmo Girl,* and novels, like *Island of the Blue Dolphin*. But best all she likes weekend evenings, when she gathers with her mother and brother to watch TV in the living room. Their favorite thing is laughing together at comedy sketches. They especially like *Saturday Night Live* and *Showtime at the Apollo*, programs that run late, until 1:30 or 2:00 in the morning. TV is an important medium in Amara's household. She has one in the bedroom she shares with her brother, there is one in the parents' bedroom, one in the living room, and one in the father's den. Amara and her brother often leave their TV on all night. "It's almost like our night-light," she says.

In contrast to the TV, the computer plays a limited role in Amara's life at home, and even less of a role in her brother's life. This is not, in the Coleman household, a result of poor computer access. There are two computers in the Coleman's apartment, and one more upstairs in the grandmother's apartment. The TAA-donated computer sits on a corner of the kitchen table, and at the time of the interviews was only intermittently connected to the Internet. Amara says she uses it maybe two or three times a month, to type homework, or to play games like solitaire or mine sweeper. A newer and faster machine, one that *is* reliably connected to the Internet and to a printer, sits in her father's den, a room full of expensive media and entertainment gear, and generally off-limits to the rest of the family. On weekends, Amara will sometimes get permission from her father to use his den and his computer to find and print out lyrics to songs she likes, or to browse the Internet for music. Amara also has use of the third computer belonging to the family – the one upstairs in her grandmother's apartment. She says that two or three times a month she goes upstairs to her grandmother's computer,

usually to do school-related research using the web, or to print out homework she has typed on her own computer, which lacks a printer.

Int: You say you use the computer to look for information?
Amara: Mmm hmm.
Int: What do you look for?
Amara: When I go on the Internet, I usually look for like, lyrics for songs, and I go on the teen thing in there.
Int: What teen thing?
Amara: In AOL, they have like, Families, Kids, then they have Teens, and that's a gate you can click on, and then you can do different things like games and stuff. But I usually don't go on the Internet really.
Int: You don't use it much?
Amara: I usually do it for homework, like for science experiments.
Int: I see. You use the Internet to help with your science experiments?
Amara: No, just typing stuff is what I mean. I use the computer to type my homework. It's mainly like a typewriter.

If Amara's relatively limited interest in home computing is not due to a lack of access, it also does not stem from a lack of experience or ease using the computer. Amara's skill with the computer could be described as that of a comfortable novice. She types with relative fluidity using two fingers, and navigates in and out of software programs with confidence. She accurately describes the difference between applications and files by saying "you make things with Word – that's the application – and files are the things you make." She can save, retrieve and print files to and from different storage media. And in a demonstration of her searching ability, she uses Ask Jeeves fairly successfully to find information on school violence -- though she has trouble finding sources that offer different explanations of it.

Amara's interest in the computer is mostly instrumental, connected to her wish to do well in school. Asked about her favorite and least favorite things to do on the computer, she found it hard to respond at first.

I don't like or dislike anything in particular about the computer. The computer is, I don't know, just regular to me.

On further thought she added a very instrumental reason for liking the computer:

I guess the reason I like to go on the computer is that you usually get better grades if you use the computer. For

> instance, in our school you get ganas, it's like extra credit, if you do something on the computer, if you type it or do a special chart. That's what I really like about the computer-it gets you extra points for your grade. That's what I really like about the computer.
>
> The homework I do most on the computer is Language Arts. Every month we have a contest, a writing contest, and in our class we have to do it. And they want it typed, so we have to type it. Because if you type your book reports on the computer, you get 10 extra points on your grade.

Doing well in school is the primary motivator of Amara's computer use, but it is not a very deep one. Neither is it very broad. The range of her homework and class assignments at ASE is quite limited. They mostly just ask for assignments to be typed, or information to be found on the web. Teachers once asked for more than this, but they stopped making more demanding assignments when they began to find that many students' families were having trouble maintaining Internet connections.

> Last year, everybody had the Internet, we had to write letters to people, and you had to email your best friend. But that was last year when everybody had the free Internet service. Now in 7th grade nobody really gives Internet homework.

Not all of the working class children were narrow, school-focused users like Amara. Three of the nine children we focused on were more involved in leisure activities than school-related uses, and one of them was a heavy user of email and Instant Messaging. But most of the working class and poor children were, like Amara, far less involved with home computing than their middle class peers.

1b. Recreational computing by working-class children: All in the family

For most of the working class children, as for Amara, the computer as a leisure medium does not compete with television, movies on video, magazines or recorded music. But these children nevertheless engaged in various forms of recreational computing -- game playing, web browsing and informal communication. For several children these activities approached or surpassed the school-related computing they did.

In the immigrant households, leisure computing was more social and collective than in the non-immigrant homes (or the middle class homes), and was often focused on aspects of the family's home language culture. The Miros are a good example of this.

Leisure Computing in a Mexican Immigrant Family: The Miros

Recreational computing by Southchester children, while not as intensive as that by Elmhurst children, was nevertheless varied. The following sections briefly describe patterns in other Southchester children's leisure computing according to the type of activity – game playing, web browsing, and recreational communication.

Game playing. Children enjoyed playing games on their home computer, and some stayed up late playing games, especially after their homework was done. The games children played most often were those that came bundled with the TAA computer – 'classics' like Free Cell, Mine Sweeper, and Solitaire. After this they played CD-ROM games that they had purchased or been given by friends, relatives and teachers, including non-educational games (like Barbie) and educational games (like Mathblaster). They played online games (popular among the middle class children) less often, partly because the lesser connectivity they had sometimes made it hard to access these games reliably.

Working class children often engaged in recreational computing – game playing as well as other activities -- alongside other family members, and frequently in collaboration with them. For the Southchester children in the study, recreational use of the computer tended to bring family members together (while for the Elmhurst children recreational uses more often pushed family members apart). Many working class children pursued recreational computing at home on weekends, when other family members, including siblings and often cousins or other relatives, were around.

> Juan [Romero] said that he and his brother have become closer [since they got the computer]. They go on the Internet together to find songs using Napster, and download and copy them to a CD. They like to look for Rap, R&B, Hip Hop, and sometimes Mexican songs. They also watch cartoons on the Web.

> All the siblings watch DVD films on the Dell computer. Now that they have the computer, they say they don't watch TV as much.

Web browsing. Other common leisure uses by working class children were shared by middle class children. These included culling pictures of musical celebrities from the Internet (e.g., Back Street Boys, Big Pun, Cuba), finding and printing lyrics to popular songs, and digital 'window shopping', or looking for products one might want to buy. Looking at clothing was particularly popular among girls, though not boys.

> Charles Allain's 'My Documents' folder has hundreds of pictures and files he has downloaded from the web while browsing. He opens about a dozen of them to show what they are. "A lot of these files are [pictures] of people I like, like Snoop Dog, and Nelly [pop music figures] and Nigerian soccer players…. And a lot are cheats and pictures for different games I like, like Digimon and Pokemon, and DB2 Crew."
>
> -- Fieldnote, Allain home

Recreational communication. Communicative uses of the computer that were informal and recreational in nature – emailing, Instant Messaging and chatting online with friends and strangers –were surprisingly infrequent among the working class children. This is in considerable contrast to their prevalence among the middle class children, who took advantage of the seeming 'fit' between these uses and a major developmental imperative of adolescence – establishing a social identity among one's peers. The relative lack of communication among the Southchester children is all the more surprising since, along with their computer, TAA gave the Southchester children and parents free email accounts and the email addresses of all the teachers and students in their school, and taught them to use email in an initial training session.

> Amara, 12: "Sometimes like the teachers, like they want us to know how to use the email and everything. They taught us that everybody has to send email to one of their teachers. And then sometimes I email my friends. Like if I find a nice picture on the Internet, then I'm going to email it to them."

Two of the children use email for school-related activities. One child, who does not have a printer at home, sends herself completed homework assignments at school so she can get them printed. The other child uses email to send in her homework and ask questions of her teachers.

> Carlita, 12: "I send an email to myself with an attachment

> that's my homework. So when I get to school, I just open my email and I print it out."

Dina Castillo, whose family is poor and on public assistance, used the computer the most – up to 18 or 20 hours a week – and she did spend a lot of time in online chats with both friends and strangers.

> Dina, 14: "Sometimes I'm bored and I want to chat with people - they could be names I recognize, or people I don't know. I call them at Yahoo chat. We talk about, I don't know. Just stuff. Music you like. Where you live, how old you are. I tell them older - like 19! They ask me stuff…"

Dina also used the school's network to email and chat with classmates and occasionally teachers, but more rarely, since it was a less reliable way to find people:

> "When I go to FirstClass [the school network], the chat is only with people in school, and there's not that many of them. We talk about where we're going tomorrow, what we gonna do in class. In the lunchroom I talk to my friends about when they will be on chat."

For the most part, Southchester children did not engage in two types of computing that were prevalent among the middle class children: multimedia computing and creative recreational computing. First, only three children had used the multimedia software applications that were most popular at the time of the study for sharing and downloading music files (Napster), storing and printing digital family photos (software bundled with digital cameras), and creating personal webpages (such as Hometown AOL). Children were aware of these uses and interested in them, and a few had tried them, but for no children were they a consistent part of their computing repertoire. Second, the creative recreational uses of the computer that were a feature of four Elmhurst children's computing habits, were not much in evidence among these children. They might search for lyrics for favorite songs online, but few used music notation software to write songs, as Ellen Wagner, a Elmhurst youngster, did. However one Southchester child, Renee, did write a series of mystery stories – on her own, not for school – and thought it was 'a great experience.'

1c. Practical-Informational computing by working-class children: Computer as conduit to the world

When working class families came together around the computer, they often did so to pursue practical activities like getting news in Spanish, browsing the history of Meso-America, or finding and printing the verses of religious songs needed for a church service. In this family context, their computing activities often had cultural resonance.

> Juan, 12: "We explore the Internet together and show mother/dad about Yahoo. We'll search historical stuff about Mexico, ancestors (Maya, Aztec emperor). We found a free English tutor for Mom [who is learning to speak English]. Dad gets Spanish news at the website 'UNO Vision.' … Some of the information about Mexican emperors we obtained from the Internet are posted on our living room walls, and the Mexican songs and religious items we typed are put in a binder."

Working class children often used their computers to help other family members – particularly parents who had had little or no prior computer experience – accomplish needed tasks. Children in this cohort spent time typing their mother's college homework, writing letters to relatives and friends in other countries, writing to newspaper editors, typing ancestral songs and religious verses (Rosario to the Guadalupe Virgin, Virgin Maria, Misterios), or scheduling church meetings and events.

> Luz's mom, Nira: "Before we had the computer in the home, we didn't get together much to do stuff. Today we use the computer together when I am typing my school [college] assignments, searching for things like scholarships on the Internet, playing games on the Internet, and scanning old family pictures."

The following portrait of the Romero children's computing describes practical-informational computing in more detail, and illustrates some of its consequences in securing advantages for both individuals and the family as a whole.

Juan and Igor Romero: Informational computing in an immigrant family

Igor and Juan Romero and their little sister Carla live with their parents, both Mexican immigrants, in a one-bedroom apartment on the 4th floor of a Southchester building that is strewn with trash in front and spray-painted with white graffiti. The building has no elevator, and three young men are engaged in a drug transaction in the lobby and stairwell when the researcher arrives with Igor for the first home visit. The children's

mother speaks no English but their father, Miguel, explains that "those people don't live here, they just use the entrance as shelter from people's eyes." The one-bedroom apartment is small and cramped with five people, but neatly organized. When I arrive, Miguel is laying on a double bed at the entrance, resting after a long day at work. The apartment's living room doubles as the parents' bedroom and has a TV set as well. The three children, 14, 13 and 11, share a small bedroom/studio, which holds three beds, two tables, and two computers.

Mr. and Mrs. Romero have little formal education themselves, but they have high expectations and hopes for their children – particularly Juan, the 13 year old, who is out today playing violin in an orchestra that is performing in Manhattan. The Romeros are from Tulcingo, Puebla and came to the United States 15 years ago. After a year in Houston they moved to New York, and this apartment. Miguel has worked hard to become an entrepreneur; he and a friend now own two small Mexican restaurants in Queens, and a small store in Manhattan that sells Mexican products to other restaurants. Mrs. Romero sometimes helps her husband in his stores, but otherwise does not work.

Igor is enrolled in a technical high school and in order to support him in his work the family bought an expensive Dell computer a year and a half ago. "He needed to have a computer at home for his school work," says Estella, the children's mother, though when asked why she doesn't really know. To this the family recently added the TAA-donated computer. "The boys said we needed an extra computer since they both used one now, and Carla too," said Estella. Both parents said that only the kids use the computers. I probe a few times and it seems that parents never touch the computers. Miguel says he doesn't know anything about computers, and this is also the case for Estella. In addition, she says she is afraid of doing something wrong and spoiling the computer.

Like nearly all the working class parents they believe strongly in the importance of computers for their children's education and social advancement. Despite the cramped circumstances, they have outfitted the children's room well with technology. In

addition to the two computers it has an HP printer, a fax machine that the children use to make photocopies of assignments for school (so they can do them twice – neater the second time, if necessary), and a second phone line, dedicated to the computer.

The Romero children use the computer for a mix of schoolwork and recreation, like all children. Like most of the working class children, they are together when they use the computer, taking turns at the keyboard, and sometimes helping one another with problems that occur. They also help their 8th grade cousin Marta, who lives in the neighborhood and doesn't have a computer of her own.

This record of the contents of their "Documents" folder gives some indication of the shared nature of their computer:

> The 'My Documents' folder on the Romero's TAA computer holds work by Juan, Igor, Carla and their 8th grade cousin. There are 16 Word files and nine Internet Explorer files. Many files don't have specific names but only say 'doc.' When we open them, Juan's files turn out to be: a book report in social studies about immigrants and life in America (the information for which he got from a textbook); a current events essay about Elian Gonzalez for his social studies class (the information for which came from a newspaper); and Juan's poem titled "Who Am I" for a writing contest happening in his reading class. Juan's cousin (an 8th grade girl) has a file titled 'Quotations I Like.' "I helped her type it, because she doesn't type so good," he says. "We got the quotes from a quotes site her teacher said." Of the nine Internet Explorer files that the children have saved to the computer, one is about the author J.K. Rowling and was used for a school book report, and the others are files connected to their use of Nintendo games. These include code files (helpful in moving to higher levels of a game) for titles like Final Fantasy 8, WWF Wrestlemania 2000, Pokemon, Final Fantasy 7, Crazy, GameSages, and WWF. The computer is thus an adjunct to their playing of video games. "Igor and I always try to beat each other on Nintendo," says Juan. "So we go on and get these codes to figure out how to do better."

Igor, 14, is the biggest computer user in the house, spending about an hour a day online. For school he types book reports on American history and science reports. He uses the Internet more than his siblings do for school, mostly to find information for his science assignments. Igor's recreational uses of the computer include playing CD-ROM sports, action and adventure games, like Dreamcast. He bought many of these with his own

savings. “I’ve spent probably $150.00 on these,” he says proudly. In addition, when a math teacher encouraged kids to get certain educational games for practice, Igor told his father, who agreed to buy “Mind Teasers”, a math and puzzles program, for the boys, paying about $15.00. Igor also shows the researcher a teen chat room he has gone to that is in both English and in Spanish. It’s a place he likes, he says, because kids can talk about the country they came from, the things they like to do in the US, and the games and music they like to play here.

Carla, the younger sister now in 6th grade, uses the computer the least. Mostly she has used the word processor. “Sometimes I lose the words, they just go away. Igor helps me get them back,” she says. “ He shows me how to change the letters and make them bigger and change the color.” “I don’t know how to surf the Internet,” she says, so if she wants information she uses the CD-ROM encyclopedia.

Juan, the middle child in whom the Romeros are investing many hopes, uses the computer about half an hour a day during the week, and longer on weekends. He spends most of his time at school: from 7:25 in the morning to 5 p.m. every day. On Saturdays he goes to school as well, and rehearses with the orchestra. Juan does his homework at home, usually after dinner, and uses the TAA computer when his brother is on the Dell. He types project assignments, essays on reading, science experiments, and social studies essays. To go on the Internet he uses the DELL computer, mostly on the weekends in between when his brother is using it, for an average of three hours. He uses the Internet, Instant Messenger, games, music, and some schoolwork (science experiments).

The Romero children also use the fancier Dell computer to watch movies and listen to music. They have eight DVD movies, and they watch these on the computer about five times a month. They have around 15 videos. They also use the CD player in the Dell computer to play music, because it has 2 speakers. However they spend more time playing Nintendo than in either of these activities. They have two Nintendo controllers in their rooms that they connect to the television on the weekends.

Juan has six people in his IM 'buddy list,' two cousins, two friends from school, and two kids from the neighborhood. He doesn't talk online much using the TAA computer. He has used Instant Messenger a few times with his cousin who lives nearby. He has also IMed with non-school friends once or twice. The topics they talked about were "Nothing, really. What's going on in the neighborhood? What are they doing? What are their plans? Sometimes I help my cousin with her homework. We also talk about music and sports."

Among the varied ways the Romero children use the computer, one stands out, and was characteristic of the more aspirational immigrant families in Southchester: informational computing that serves the family's practical needs.

Mr. and Mrs. Romero enrolled Juan in ASE as soon as they heard about it, and the school has been good for him, they say. He has been put into the honors classes, and the orchestra. "We had not much school," says Miguel, and these programs help his child "learn, and get into the world, and do better." Most important, a teacher at the school contacted them about a scholarship fund offered by the Albert G. Oliver Program in Manhattan for promising African American and Latino high school students interested in attending a boarding school in West Town, Pennsylvania. With Igor's and the teacher's help, Juan found the website for the scholarship program, downloaded the application, and filled it out. When a question about the form arose, they found a telephone number on the website, and the boys called together, nervously. Juan was accepted into the program. "He is going in August," say his parents proudly. They must pay $500 a year for his bus transportation, but they do not doubt that it is worth it.

Juan admits that he is more than a little scared of leaving home to go to boarding school at age 13. But he says "I am happy about it, because I'll be on my own, I'll be independent. And I'll get a good education." His family borrowed a car and visited the school in February, and to find their way there Igor printed out directions from the school's website, and the boys read them to their father as they drove. The school

looked cold, says Juan. He knows he will come home for all the vacations, though. Also, he is planning to use email to stay in touch with his brother and sister, and through them, his parents. "They don't know how to use the computer, but Igor can type for them," he says. "It's cheaper than calling." He also wants to stay in touch with his friends and teachers from ASE, which provides a follow-up website for alumni.

Meanwhile, Juan is using email to talk to a new friend – a boy in New Jersey who will be his roommate in boarding school. The school sent them each other's address, phone and email address after they were matched as roommates, and Juan got an email shortly afterwards. "We talked about our families, where they are from. His parents came from Guatemala. He likes to play soccer too. He got better grades than me, but he doesn't play in the orchestra."

Juan's departure in August will be a big change in the Romero family, an enlargement of their world. "We never went to Pennsylvania before," Miguel says. "We're looking for a car now, maybe a van, to take everything there for Juan." Igor and Juan have tried to help their father in the search for a car to buy. While he has read the auto ads in the Spanish language newspaper, they have gone online to find out the average price of the cars listed there, by make, model and year. So far they haven't found one he can afford, but they are still looking.

In the Romero children's practical-informational computing we see one way that working class children use the computer differently than their middle class peers. In this study, children from the more aspirational immigrant families – families dedicated to moving their children up and out into the world as quickly as possible (to boarding school, applying for scholarships to summer programs, looking at college and arts programs) – use the Internet to connect with and cement their relationships to people and resources beyond their family. In doing so these children are making up, in part, for their parents' relative lack of language skill and experience in dealing with outside institutions. The computer and Internet, in these families, is becoming a tool of social advantage, as

children use it to stitch themselves into institutions that will give them greater educational opportunities and very likely, the opportunity for greater class mobility.

Dina Castillo: Computing as Coping

If some Southchester children from striving immigrant families engaged in informational computing that helped connect them to outside opportunities and resources; others engaged in computing as a means of coping with highly stressed and chaotic household circumstances. Three children fit this pattern. This section describes the experiences of one, Dina Castillo.

Dina Castillo is 14, and in the 8th grade. A bright girl, she nevertheless does not do well at school. At the end of the year she will be held back (for the second time in her career) rather than going on to high school. She and her family do not talk about this, however, during our last interview. Instead they take pride in all the complements she has received on her fancy hair style, done up in beautiful plaits especially for her class' 'senior trip' to Baltimore.

Dina's household is an extremely stressed one, plagued by health problems, poverty and problems with alcohol. Her mother Dulce is a single mother of four, and has been on welfare for most of the past two decades. She must care for Dina's sister Juanita, 17, who has severe cerebral palsy and needs almost round-the-clock nursing, and her grand daughter Sarita, who is 7. Another older sister, Serena, 24, has had to leave an abusive boyfriend and is living in the household as well. Five family members, all female, live in the three-bedroom apartment, in a housing project that is not one of the safest in Southchester.

Dina's home is also chaotic. During a typical visit her older sister comes and goes from the apartment without saying anything. A nurse wheels her 17-year-old sister Juanita out in a wheel chair. The noise from her breathing through a portable respirator is so loud that, combined with the nurse speaking to Juanita relatively constantly, it is difficult to hear. Boxes are stacked in the living room and hallway making movement difficult.

Neighbor children and a cousin of Dina's come in and out of the apartment to watch TV and listen to the interview. Dina's mother Dulce, watching TV with a swollen ankle lifted on the couch, seems only partly aware of everyone's movements. Dina finds it difficult to concentrate during the interview, and later it turns out that she has not eaten for most of the day.

One way Dina copes with these circumstances is to cultivate a wide circle of friends, and get out of the house as much as possible. She is out in the world – socially, physically, emotionally – far more than the other adolescents interviewed. She moves among mixed-sex, mixed-age kids, and travels around the city with them, as well as hangs out outside her building to chat with friends and neighbors. Dina says proudly that she has more than 100 friends. "Half of them live across the street, down the block, off the block, in the building (i.e., the projects)," she says. Half are boys and the other half are girls. Mostly they meet on the street, at school, at the pool during the summer, and ice-skating ring during the winter. They don't visit each other's homes. In the last year or so they've begun riding buses and subways to get to different parts of the city where there are stores they can hang out in front of – sneaker stores and clothing stores where the most fashionable brands are.

The other way Dina copes with chaotic household circumstances is with media. "I like to stay in my house and watch TV. And go on the computer," she says. Dina spends several hours each day on the computer by herself. Most of her time is spent either chatting with strangers (and occasionally emailing friends and teachers), or browsing the Web and downloading pictures of things she would like to get. Dina usually goes to specific teen web sites – her favorites are gurls.com, talkcity.com and Yahoo teen chat for ages 15-17. The chat rooms and pop-up ads on these sites are her major point of entry into the world of the web. For Dina and two other children who follow this general pattern, the computer and web are mainly an image-heavy extension of the popular entertainment world of TV, movies and teen magazines. They are also conduit to private social exchanges in which they can try out and act out roles, often pretending to be older than they really are.

Dina's computing seems to have three functions for her – a source of competence, a way to interact with a wide range of others and, and as a way to participate vicariously in the wider consumer culture that her family cannot otherwise afford.

Dina is the most skilled one in the household with the computer. She uses it in the living room, the most public place in the apartment, and her mother and the nurse, her little sister, and various others – neighbor boys, cousins who come in – look and watch. Dina seems to revel in displaying her competence in using the computer. "I like, you know, just going on it …. doing stuff….finding things I want to get. … chatting. It's easy for me." She shows her cousin and two school friends, plus her best friends in the building, how to play the games she likes, and also how to use PowerPoint and type for fun. Her competence rests on school experiences going back to 2nd grade, when she began playing computer games at school. Dina is not doing well in school, but the computer is clearly a medium that she has competence in, and a source of good feeling for her.

Dina's online communications seem to be part of her penchant for social networking – a way she gets distance from real-world adults and from home, and practices roles that seem to her closer to adulthood.

> Dina enters a chat room and says 'Hey what up?' to about 22 virtual 'friends'. She is quickly recognized. A private message pops up saying 'Hey D waz up.' When the researcher asks who it is, Dina replies, "Oh, just a guy who likes me." She looks both proud and a little embarrassed.
>
> [Fieldnote]

When asked what she likes about IMing and chatting, Dina pauses. "I don't know... you can just meet people…guys….and talk to them, and …. it's just you and them. And you feel, like, special."

Dulce says there are no rules around the computer. She says Dina uses the computer all the time, but she prefers this to having her hanging around outside all the time. The kids usually go to bed by 11:30 PM, and she doesn't want them outside late like that. "It's better if they're in here watching TV, or on the computer," she says.

Dina's computer is also a way to participate vicariously in the wider consumer culture in ways that, otherwise, her family's income does not allow her to do.

> The 'My Documents' folder on her computer's hard drive has 15-20 files that Dina has downloaded from e-stores on the Internet. Almost all are images: expensive high-end sneakers, brand-label dresses, a cell-phone picture, shorts and tops that she likes, hairstyles of celebrities that she'd like to emulate. Asked why she has downloaded these particular items Dina says "Cause I wanted 'em." [Fieldnote]

Finding, downloading and storing pictures of expensive products seems to be, for Dina, a type of possession. "This my Coogi [dress]" she says, indicating a picture full-length, knitted dress in blue and white, and using the possessive pronoun. "It's knit, and it has this hood, see. It's about a hundred fifty dollars," she says. She talks knowledgably about other details of products she has 'acquired' in this way.

Finally, Dina has used the digital medium to reach beyond her limited family resources to connect with outside help-givers. A month before the research began, Dina was involved in an incident in which an adult male aide in the school may have been sexually harassing her; she says they were friends but then he started 'bothering her.' While the circumstances remain murky, what is clear is Dina's response: she emailed her school's female principal about the incident. Dina showed the researcher a series of email exchanges with the principal of her school, in which the principal repeatedly expressed concern, asked Dina to tell her more, reassured her and made arrangements for her to come and talk to her and other school staff. On her part, Dina expressed ambivalent feelings about the male aide, and the idea of talking about him to an authority, and maybe getting him in trouble. Asked by the researcher why she had used email instead of going to the principal or a counselor in person, Dina said, "I don't know. They's just all around, and you have to ask to see them alone. It's the principal's office and everything. It was just easier [with email]."

How this incident was resolved was unclear, but the exchange illustrates the unexpected ways that networked technologies may function in the lives of poor children who lack

family resources for coping with difficulty. Dina had the option of emailing the principal because the school had distributed the email addresses of the entire staff to all the students when the TAA computers were given out; they wished to promote the idea that, as a staff, they were available to children and their families (probably unaware that this kind of response might ensue). For Dina, a teen who is adept at communicating electronically, email provided a channel to school authorities that felt easier and less daunting than a face-to-face exchange. It is possible, even likely, that without the email connection she might not have spoken with any adult about the incident. As a response to her chaotic life circumstances, then, Dina's use of the net was double-sided: she often used it to connect with adult strangers, in ways most experts in youth development would likely find troubling; and at other moments she used it to reach out and seek help from education and youth advocates who felt more available to her online.

To summarize, then, we found that the Southchester children as a group spent less time using their home computers than their middle class peers, and they used them mostly for routine schoolwork like typing homework, playing simple software games, and browsing the Internet for pop cultural images and music. They did not make intensive use of the computer as communication medium: most used email occasionally, but few used Instant Messaging, partly because the IM software was not sufficiently diffused in their peer networks to make it worthwhile. However, two clearly contrasting patterns of computer use emerged in this group. Children in the tighter-knit immigrant families tended to use the computer collaboratively; they played games together, and often helped siblings and parents with tasks like typing papers, printing flyers, etc. A subset of these children engaged in what we have called 'practical informational' computing – using the computer to increase their own and their family's income and educational opportunities. Meanwhile, children in families that were economically and emotionally stressed tended to use the computer by themselves, in ways parallel to the ways they used television and other media -- as a means of distracting themselves, and perhaps gaining a measure of seeming control over chaotic life circumstances.

2. Elmhurst Children: Broad Recreational Users

Elmhurst children's home computing is characterized by several things that distinguish it from the computing done by Southchester children at home. First, recreational computing leads school-related computing for these children. Eight out of ten Elmhurst children spend more time in recreational pursuits with their computers than they do on their schoolwork. Second, as part of their recreational computing, these children spend far more time communicating with peers online than do their Southchester counterparts. For Elmhurst early adolescents, AOL's Instant Messenger, which makes a fluid group of peers potentially available at all times, was the 'killer app' during the period of this study – the one 'must-have' software program. Children also use email and visit online chat rooms, sometimes engaging in behaviors that their parents would likely be nervous about. Like the Southchester children, Elmhurst children also spend time playing games and browsing the web for fun, looking at information and pictures about pop music, TV and movie stars, and consumer products, especially clothing and fashion. Unlike them, the games they play include simulations and role-playing games, and they also use advanced consumer tools to download music, make personal web pages and work with digital photos. Compared to the Southchester children, Elmhurst children as a group make far more intensive, more diverse, and more active, use of the computer as a recreational medium.

Elmhurst children use their home computer to do schoolwork as well as recreate. Like the Southchester children, much of the school-related work that children do is routine typing of homework, and web-searches for factual information used in reports and presentations. Unlike the Southchester children, however, over half of the Elmhurst children use the computer as an information tool in more involved and demanding 'projects'.

Elmhurst children find it a challenge to balance school-related and recreational computing. In fact, we saw a blending or blurring of the boundary between these activities. Children in Elmhurst routinely had Instant Messenger on as they did their

homework, and would move back and forth between a document they were typing, the web browser, and the Instant Messenger screen. Sometimes the content of communications would be about homework, and sometimes students would use online homework help creatively and flexibly; most often the parallel communications were unrelated to the schoolwork being done. The consequences of this kind of 'multi-tasking' appeared to be different for different children: some had little trouble and even said they had a hard time concentrating when there were fewer simultaneous inputs; others had difficulty completing homework tasks until late at night, if at all.

Finally, a subset of Elmhurst children engage in what could be called creative recreational computing – projects that involve significant investments of time and effort, are not related to school assignments, and in which shared products or skills are being built.

Practical/informational computing is not central for this group, nor are income-related uses. In Elmhurst, these uses of the computer appear to be the domain of middle class parents, whereas in Southchester, especially in the immigrant households where parents had little experience with the medium, children used the computer to find practical information of help to family members and themselves.

2a. Recreational computing in Elmhurst

Only Connect: Online communication by middle class adolescents

Seven out of ten Elmhurst children use the computer for communication more than, or as much as, they pursue other purposes. Four children could be called "high" communicators — they say they go online every day to talk to friends using AOL Instant Messenger, and they have between 50 and 120 buddies on their Instant Message buddy list. Three children could be called "medium-to-high" communicators — they say they go online three or four times a week to IM or check email, and they have between 20 and 50 buddies. The three remaining children could be called "low" communicators — they say they go online to check email once a week or less, and they have between 0 and 20

Instant Message buddies.

Elmhurst children "talk" mostly to people they know and see regularly — peers from school, other local kids they have met through these friends, friends from summer camp, and more rarely, relatives. They frequently exchange AOL screen names with new peers they meet. The fact that so many peers' households are online with AOL means that a ready-made social milieu exists online for them. Elmhurst children prefer using synchronous communication (Instant Messaging or chat rooms) to using asynchronous communication like email. Messaging for them is recreational rather than instrumental — they do not go online to talk to specific friends so much as "to see who's on, and to talk."

> Lucy, 12: "I like IMing best. On AOL. Talking to friends. I run home after school so I can beat my brother to go on. All my friends have it, practically, so when they're on, I can talk to a bunch at the same time. I like using AOL better than the phone, and that's why."

The content of children's Instant Messaging focuses on gossip about friends and relationships, school, and making plans to get together. In the following excerpt, Julie Christian, whose screen name is Jazzygurl90, chats with a girlfriend from school.

```
Jazzygurl1989:    what did you get in science?
YankeeesRule123:  I did terrible.  Like 77.
Jazzygurl1990:    that wuz so hard!  Ms. Lizard sucks.
YankeeesRule123:  what'd you get?
Jazzygurl1990:    like 91.
YankeeesRule123:  ur a bitch!  (icon for laughing)
Jazzygurl1990:    (icon for laughing)
Jazzygurl1990:    Whut did MB say 2 u?
YankeeesRule123:  nuth.  A was there.
Jazzygurl1990:    u shd tell him u lik him
YankeeesRule123:  yeah rite.  not w A there!!!!!
Jazzygurl1990:    whys she always around?  I HATE her.
YankeeesRule123:  She needs a LIFE
Jazzygurl1990:    g2g
YankeeesRule123:  u going to Allys?
Jazzygurl1990:    si. u?
YankeeesRule123:  i wanna.  have to ask.
Jazzygurl1990:    k. talk later
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YankeeesRule123: k bye
Jazzygurl1990: bye

In form, Instant Messages are highly abbreviated and slang-ridden, appearing almost coded. This is a feature that the middle class children depend on to shield their messages from the eyes of parents and siblings, especially when the computer is in a semi-public place. The peer exchanges they engage in appear to be closely connected to the social self they are fashioning amongst their peers during this period of early adolescence. Accordingly, children express an intense desire to shield their IM exchanges from other household members, especially parents.

> Mark Fleischer: My mom and step-dad are always sneaking up behind me and trying to look at the screen (laughs)… I think they're just curious. You know, who am I talking to, what I'm saying, what I'm doing. But they're my friends, it's my own business. I don't listen to their phone calls. They can't listen in on mine. Or see this either. So I just block them [from seeing the screen]. Or I tell my friend 'brb', and I minimize the window. Then when they're gone, I open it again.

Email appears to be a transitional medium into Instant Messaging for these children. Most children describe a trajectory that begins with getting an email account, usually from a parent as part of the package offered by online service provider, when they were in 5th or 6th grade. Many initially email regularly with family members (usually parents and aunts and uncles) and friends, including camp friends. However by early 7th grade, as they discover that many of their friends are Instant Messaging one another, they have successfully appealed to parents for an account and a screen-name, and Instant Messaging quickly begins to supplant emailing. Among the girls in the study, however, we found that email use persisted as a way to have more detailed, in-depth and emotional exchanges with girlfriends.

> Rene Mitchell: Email is more, like, personal than IM. It's deeper. You don't just have quick conversations. It's more like you're writing a letter. Like, I don't IM with my friends from camp. We just have each other's email. And we write longer notes to each other, like about a birthday we had, or a really fun trip maybe, or breaking up with a guy. Stuff like that. I don't email with any guys – it's all IM with guys. I only email girls who are good friends.

Other than this, email use appears to be more functional in nature than IM and chat, which are more recreational. Children described emailing friends when they are not on

IM, to ask them why they are not on. Three described sending homework assignments to each other. They receive email greetings and email "forwards" (of jokes and websites) from friends, and sometimes they reply or forward these to someone else they know. Only one child has no email address of her own, but borrows her father's account if she needs to send something.

Four of the Elmhurst children – Dawn, Tucker, Mark and Ellen – go online to chat in AOL chat rooms in addition to Instant Messaging. These children begin with AOL's 'teen' chat rooms, but often they proceed to other rooms that are for adults such as 'North Jersey' and 'Relationships'. These rooms provide access to a far wider group of people, (by location, age, sex and motivation for talking) than do email and Instant Messaging. They are also anonymous. They thus hold attractions for adolescents interested in social experimentation, in testing their ability to enter larger, riskier social worlds.

Chat room interactions occupy long stretches of these children's afternoons once or twice a week, and sometimes late at night, they say. In chatting online, children must strive to manage an "identity" among strangers (remembering from one moment to the next answers they have given to questions about their age, her marital status, etc.), rebuff inappropriate people and advances, and interpret information in people's profiles to form a picture of the conversational "other." They are fluent in the conventions of the medium, in navigating through lists of names logged on, checking profiles of fellow chatters, and in at least two cases, attaching files to messages. Some of the behaviors children told us about or showed us – such as using obscene language, harassing others in chat rooms or sending pictures of themselves to people they had met online – would be considered inappropriate and/or dangerous by many child Internet advocates, and certainly by their parents. Many are explicitly against the rules established by AOL, which hosts the chat rooms these children use most often. Dawn has successfully evaded the monitors that lurk in AOL chat rooms to censor what is considered obscene or harassing language. She has gotten warnings, but has not been kicked out of the network altogether. However Tucker, and Ellen's brother Bill, were stripped of their AOL usernames for violating AOL's rules on appropriate language use in chat rooms. They

were later reinstated with their parents' intervention. And at least some of this activity, for these children, seems connected to a sense of boredom that these middle class children describe.

> Dawn Gillette, 13: I just like to mix it up with people I don't know. I don't know why. Maybe because it's so boring here [in Elmhurst]. I tell people I meet online I live in Deadwood.

The following profile of Dawn, a middle class 13 year old, offers a glimpse of the way that both IM and chat serve some middle class early adolescents as a form of social experimentation that copes with what they experience as boredom.

Dawn Gillette: Online Chatting, Social Experimentation and Adolescent Boredom

The Gillettes moved to Elmhurst from the Upper West Side of Manhattan two years ago, and the family seems determined to hang onto an urban identity in the midst of the suburb. Their house is small, a cute yellow wood frame near the high school, but it is eclectically furnished. Morgan Gillette, 46, dresses in black, dies her hair a metallic shade of red and is fond of making knowing and skeptical wisecracks, about her children, the town, and the schools. She works in a nearby town as commercial designer, work that takes her all over northern New Jersey. Jeff Gillette, 50, is an imposing 6 ft. 5 inches tall and stocky, and works as a construction manager in Manhattan, taking the train into the city early in the morning and returning tired at night. He speaks with a broad New York accent and loses little time in letting a visitor know that he was born and bred in the city as a working man, and has little patience for "the kinds of BS that go on in a small town like Elmhurst – the tax assessments, the ways these school officials are on the take." The family moved to the suburbs "because we couldn't swing a bigger place in Manhattan – the prices are just insane." "Also," says Jeff, "we figured it would be good for the girls."

Dawn, the eldest of the two Gillette daughters, looks older than her 13 years, mostly because she is large in stature like her father. The family's move to Elmhurst corresponded with Dawn entering middle school, and an early adolescence. She describes the adjustment as hard, leaving her friends and the more hip and populous world she knew in the city. Her AOL

profile lists her location as "Hello Kitty Land," which she says tells people "there's not much going on here, it's a small town." Morgan says that while Dawn has a group of friends at school, her circle of friends is smaller than many of the popular, fashion-conscious girls', "maybe because of her size." Dawn herself says that the computer for her is one of the ways she has "more of a social life." She spends one to two hours Instant Messaging each day, and seems clear that, for her, it is a way to keep occupied with a large circle of people, some of whom she knows well and others, including boys, who she knows more peripherally.

> Dawn, 13: "The difference between IMing and phoning people is that online you have more of a social life. You talk to more than one person at a time. You talk to boys you know just a little bit, and who don't go to your school. It's like you have a whole screenful of friends you're talking with. On the phone you can only talk to one at a time, but the good thing there is that you always know who you're talking to. Online you're sometimes not sure who you're talking to."

Each weekday Dawn gets home from middle school on her own, walking or getting a ride with friends, while her little sister Ellie, 8, stays in the After School Program. At home in the afternoons Dawn watches TV in her room, talks on the phone and goes on the computer, until her mother and sister get home at around 6:30pm. One of her favorite things is being in her room and watching reruns of cop and lawyer shows - Law and Order, Investigative Reports, Murder She Wrote. They have clearly fueled her thinking about her future. "I want to be a forensic scientist," she says. Dawn's room is painted purple, strewn with clothes and covered with posters of male pop stars, and full of media. In addition to a TV with cable, Dawn has a boom box for the CDs piled on her dresser, and she says that soon she will be getting a phone put in, and maybe the downstairs computer as well. Dawn says she uses the computer and Internet more than she watches TV or movies, or listens to music. She is typically on the computer at dinner-time, which comes around 7:30, and there are frequently conflicts around getting her to come to dinner. "They tell me to come, and I keep typing," she says. "Then my father comes in and gets mad, and threatens to shut the computer off, and sometimes he does. That crashes it." She often starts her homework before dinner, but she usually has to finish it later at night, at 8 or 9 o'clock. There is not a lot of homework for her, she says, in her Level 3 classes (the middle track in the middle school). Still, she will sometimes get up early before school to type her homework on the computer, since she would rather not use the computer for

typing in the afternoons and evenings, when friends are online. "I don't want to miss anything," she says. When she has been online too much, which happens about once a week, she says, she has to find time during the next school day to make up homework she has neglected.

> Dawn draws a circle to represent all the time she spends on computer, and marks off about 75% of the circle and labels it 'Chatting.' Next she marks off about a quarter of this area as 'AOL Teen Chat.' The rest, she says, "is just chatting with my AIM buddies." When we look at Dawn's AOL 'buddy list' it contains 87 names. Almost 50 of these appear under the heading EMS - meaning they are other students at Elmhurst Middle School. The category 'Camp' contains friends she has met at camp, and there are 18 names here. Finally there are about 20 names that are not assigned a category. Dawn says that these are people she has met and talked to in chat rooms, and added as a buddy. [*Fieldnote]*

Asked about the 20 people in her buddy list whom she has met online, Dawn says they are acquaintances, not friends. "Either I talked to them once in a chat room and they seemed nice and added me as a friend," she says, "or someone else introduced me, like, in a group chat."

> Int: How often do you IM with people you haven't met in person?
> Dawn: Basically every day. I mean they're just there online, with some of them it's kind of like I know them by now.
> Int: What kinds of things do you talk about? Can you show me?
> Dawn: Sure, like right now Zwoffer22 is on. He's funny. *[Dawn types 'hey wassup']*
> Int: What do you know about Zwoffer22?
> Dawn: Well his profile says he's 22, but I think he's really only like 15 or 16. He's in Florida. *[Reply appears: 'whacha doin'; Dawn types: 'jus chillin. u?]*
> Int: Why do you think he's younger than his profile says?
> Dawn: Because kids want to be older than they are. Basically people lie in their profiles. You put in your name, sex, location, interests, personal quotes, if you're married or not. But people always lie. *[Reply appears: 'watchin a porno'; Dawn gets embarrassed and laughs, then types: 'ur GROSS. liar.']*
> Int: If people don't tell the truth online, is that a problem for you?
> Dawn: No, it's fun. You check out their profiles, follow them up, and see if you can figure out what kind of person they are.
> Int: What clues do you use to figure that out?
> Dawn: Hobbies, occuptions and personal quotes are usually true. But the names, locations and ages are probably lies. Sometimes sex, too."

[Reply appears: 'i AM'; Dawn types: 'then stop – now ur talking w ME']

Int: What kind of person do you think Zwoffer22 is?

Dawn: I don't know. He's just a guy. He's funny. He always says stupid stuff like this.
[Reply appears: 'ok i rather chat w u anyway'; Dawn types: 'thats better. how old r u really'; Reply appears: 'u forgot? wow r u a dumb bitch. 22'; Dawn types: 'liar. ur only 12 1 bet']

Int: Has anyone you talk to online ever made you feel uncomfortable, or concerned about anything?

Dawn: No. My favorite quote [i.e., the quote that appears in her Online profile] says 'Don't mess with me, and I won't mess with you.' I saw that on this girl I know's profile and I thought 'I like the way that is – very straightforward, so people don't send you junk.'

Int: What kinds of junk have people sent you online?

Dawn: Just annoying stuff. [pauses] Like when people send you a message with only a period in it. It can get annoying."

Dawn's setting on AOL is 'mature teen,' a designation that captures with some irony the predicament of contemporary middle class adolescents and their parents. For in fact, Dawn is barely a teen (having turned 13 only a month before), yet through the media – including and especially her family's computer – she has access to aspects of adult culture that no other generation of children has had. When Dawn uses the computer she is almost always alone, in the den, out of sight of others. Dawn's mother, in using AOL's parental controls to set her account to 'mature teen', has tried to place *some* restrictions on the Web content to which she has access. The filter blocks websites with adult-sounding language and sites related to R-rated movies and songs with 'explicit' lyrics. But Dawn proudly shows us tricks she knows that get around the filter. "I have pretty much freedom" to use the computer, she says. "But I don't have as much freedom as some of my friends," she says, "because they have access to the whole web all the time."

Dawn says she checks to see who is on IM at uneven intervals throughout the afternoon, evening and weekend. In moments of boredom, idleness or transition, such as between television shows or while a visitor is talking with her parents, she'll go to the computer and quickly check to see if anyone she knows is online. When there are no buddies available on AOL Instant Messenger, Dawn often goes to one of the chat

rooms or message boards maintained by MTV or AOL, such as 'AOL TEEN.' When Dawn is home alone with longer stretches of time, she likes to go to Teen Chat because, she says, 'otherwise I'm just bored.'

The following description of one of Dawn's chat sessions suggests the connection between adolescent boredom (which appeared as a frequent theme among the middle class children), online communication and social experimentation.

Fieldnote on a chat session

It's 4:00pm on Saturday and Dawn is at the computer behind the desk in her family's den. This is a sunny room off the living room that also functions as a storage area – there are cardboard boxes stacked in the corner, an exercise machine, shelves with technical manuals and an old computer, and a couch that is covered with papers. Her parents are out on errands and her little sister is at a neighbor's playing dolls with a friend.

From the AOL homepage Dawn navigates to the Teen Chat area. Once there she clicks on several of the different chat rooms, trying to squeeze into one, but they are already full. "Each room only can only have 23 people in it," she says. "They're usually packed. You can try for hours and not get in sometimes. It's really a drag." But after several tries Dawn lucks out. A message on the screen proclaims 'Logging Dgirl730 into Teen Chat.' "Yes!" she exclaims triumphantly, raising her fists.

In the main window, telegraphic messages are appearing one after another, scrolling up the screen. Dawn reads the new entries for a moment, then jumps in. She types *hi room*.

There is no response from the room. Her message scrolls up the shared box, surrounded by comments that do not register it. A user named baadass88 types *this room is BORING*. Dawn types another message, concurring: *I agree with badass*

This gets no response either. Dawn clicks to the profiles of one or two of the others in the room, popping a window up that shows their sex, age, name, location, interests. "Yeah, I'll bet she's 16," says Dawn about a user who identifies herself as a 16 year old girl from Georgia. "She's probably 10."

After a while Dawn becomes offended that no one has addressed her yet. "I can't believe these people are ignoring me," she says. She types *does anyone want to talk to me?* And then *this room SUCKS!*

There is no response still. Dawn is starting to get annoyed, but she's been here before. She tries direct rebukes. *Why don't you ppl answer me? Whas wrong w u?* Then after a pause *You ppl are MEST UP.*

Still ignored, Dawn tries another approach. She clicks to the profile of one of the users who has been chatting steadily in the main space, partygirl223, and finds that she claims to be a girl of 14 (a little older than Dawn) but has indicated her status as 'married' instead of 'unmarried.' She quickly returns to the chat space and types: *Partygirl is really married*.

Finally she gets a response. *No Im not! Im only 14.*
Dawn fires back: *You shouldn't tell lies. RU a liar, partygirl?*
I'm not, Dgirl, you are is the response.
Dawn types *Well maybe u shd read your OWN PROFILE, partygirl.*

Dawn is now getting responses from the other people in the room: People in the main window are now talking about her, not just ignoring her:

Dgirl is mean.
Dgirl is in a bad mood.

Dawn now squirms with glee. "I like getting into fights online. I like taunting people. It's so fun. Don't you love this?" She continues to pursue partygirl using Personal Messaging. She writes her a private message saying *Partygirl you're really a guy, aren't you*. Partygirl responds privately, asking Dawn to leave her alone: *PLS Dgirl just leave me alone. I don't wanta talk 2 u.* But Dawn just taunts her back, in a mocking way. She types: *You're the one that PMing ME now – I could report you*. Partygirl: *Just LEAVE ME ALONE*. Dawn: *But I LOVE you, Partygirl*.

While she pursues this exchange Dawn keeps checking back in the main space to see if Partygirl has logged off. "That's my goal – I want to drive her out of the room. Oh, shoot, she's still in there. I have to keep going. I want her out of that room."

In the main chat space people have taken note of her. "*Dgirl why are you in such a bad mood?*" One user, who seems to be a girl about her age has begun Private Messaging her, and her inquiries are friendly: *Where do you live*. But Dawn seems happy to have stirred something up, and doesn't want just a friendly talk with someone. *I don't have time to talk now, sorry,* she types.

In this exchange we see Dawn using the computer as way to cope with and organize her boredom. This was a theme we saw in several of the middle class households, where

early adolescents who had previously been occupied with adult-organized activities like lessons and sports, were now beginning to spend increasing time at home alone or without the direct supervision of adults, and were turning to the computer during these periods. For these children, online communication served partly as a way of occupying time, a way that provided reliable low-intensity social stimulation. With Instant Messaging, an informal conversation among peers is potentially *always there.* Several of the middle class children described the pull of this always-available conversation as a solution to their ennui or boredom.

> My mom complains that I'm on IM all the time - but I'm not! IT'S on all the time - I leave it running on the computer - but I don't really spend that much time chatting. I just check it a lot, just to see who's on, or what away messages people have put up…. [Int: Why do you like to do that?] I don't know. It's funny. When you're doing something else, like I'm supposed to practice [piano], but I'll be so tired. I'll just go and check IM before I sit down. It's like, you know your friends are on there, and they might have said something funny. And…you don't want to miss anything.
>
> -- Ellen Wagner

For Dawn, and for one other girl in the study, Instant Messaging, and even more so, online chat rooms, are used to exercise their 'attitude' freely – including negative, critical and hostile feelings toward others – and without consequences.

> "I love taunting people," Dawn says. Asked why, she replies "It's just fun to have attitude. Plus, you'll never see that person face to face. And they can't kick you off unless you say something bad - like a curse word. So there's no way they can get back at you."

Online chat provides adolescents like Dawn with social interaction free of social consequences. Several of the chats we observed seemed to serve as a sort of one-sided *simulation* of social interaction for these children – one-sided because so many of the cues that might remind them of their responsibility to others are missing – faces, real names, the sound of a voice. In this context it takes a conscious effort of the imagination – an effort of sympathy or empathy – to remember that the people on the other end of each interaction have real selves, with real feelings. Dawn is convinced that many or most of the people she interacts with are lying about the most basic aspects of who they

are – their age, their sex, their name, where they live. She experiences little social anxiety in the face of this uncertainty; instead she sees the preponderance of masks online as a rationale for acting aggressively towards those she chats with – because they are wearing a mask, and because she is, too.

Sherry Turkle (1995) and others make much of the 'identity-switching' that is possible in chat rooms, and argues that it should be seen as cutting-edge postmodern 'work' that children do better than adults, because they are in such a shape-shifting part of their lives. But Dawn's experience suggests something else: That online chatting of this kind is less a mode of 'self work' than a form of emotional shadow-boxing or punching-bag practice. The relation of this online activity to her day-to-day social life remains murky, but it is possible that she is 'practicing attitude' because she does not feel she has the freedom to do this among her face-to-face peers. With her peers she is not very caustic, she says, but certain of her friends are. "With my friends I don't talk that way…sarcastic and put-downy," she says. "But Nicole and Diana do all the time."

A second perspective, the moralist viewpoint on online chatting, insists that norms of behavior online should match norms of behavior offline. Linda Wagner, a middle class parent who has had to intervene in her son's online chatting, represents this perspective when she says "Now I tell my kids they can only say things online that they would say in person – the rules are the same." However, as Dawn's experience suggests (and as we will see in the following chapters) adolescent and parental interpretations of online communication clash at exactly this point. For adolescents, online communication may be compelling precisely because its rules are *not* the same as in everyday life.

Game playing and web browsing in Elmhurst

Games the Elmhurst children played include CD-ROM-based games like X-Men and the Sims, educational or "edutainment" titles like Math Blaster or Carmen Sandiego, and common computer-based games like Solitaire and Free Cell. Five children said they played games on the web regularly, including Neo-Pets (an adopt-a-pet game), doll dress-

up games, online chess, and networked battle games where they compete with remote players.

Phoebe, 13: "Mostly I like playing games, like Sonic Adventure. Or Spiderman, or Arcade. We also have learning games on CD-ROM. Like Treasure Math Storm. I used some of the CD-ROMs in school and then I asked my mom, and she got some for me."

Ellen: Some of the time I'm on the Internet is just finding games. Like, I like cartoon dolls, the kind of dolls that I was using before, and I find a lot of stuff about that. But I find other games like lemonade stand that you can play.

Carl Logan: Game play by a middle class boy

Carl Logan is a quiet, shy boy of 12. Tall and thin, he seems more child-like than many of the middle class children in the study. Since his father died three years earlier, his social life has revolved around home, and his relationships with his mother and younger brother. He has two or three school friends who he sees outside school, but that's the extent of his peer socializing. For Carl, Instant Messaging is not (yet) a way to reach out and develop a social network. "There are six people on my buddy list," he says, and adds wryly that "me, my mom and my brother are three of them. I can't IM them, because there's only one computer and they're not on when I'm on. And when you IM yourself it's funny, because you say 'hi' and it says Carl: hi. Carl: hi."

Carl's bedroom reflects his interests in science fiction, sports and games, pop music, and doing well in school. Large Star Wars and soccer posters are on the wall, and on a shelf sits a large collection of Star Wars Legos that he has assembled. He explains that he and his mother used to do this together. "When I was little I liked to play with Legos but now I just like to build and collect them." A walkie/talkie he points to was used during a recent ski trip, he explains, "so that my mom and I wouldn't lose each other on the slopes." Carl recently got a portable CD player as a gift, and he has a small collection of CD's to play on it, mostly the popular fare for teen boys like eminem and Blink182. His desk is extremely neat; in the corner sits a calculator and a cup with extra pencils and pens, a ruler, erasers and white-out, all ready to go. A shelf next to the desk holds extra textbooks that his mom has purchased so that Carl doesn't have to carry them back and

forth all the time, and has an extra set always at home. Above the desk are pictures of his ski trips, one of his father, and the report cards that he has gotten in the last year – showing all As and a few Bs.

Carl describes his leisure time using two categories. The 'electronical' things he does include playing video games (Playstation2) and computer games, watching TV and movies, and listening to CDs. His 'non-electronical' past-times include bike riding to town, playing soccer, practicing the sax and going to church events, The family's involvement in church is important; church and its social relationships have been a big support for Carl, his mother and his brother since their father died.

Normally shy, Carl becomes most animated in showing and talking about the computer games he loves to play. He spends the greatest amount of time playing with his Playstation2 and Nintendo game boxes (games that do not involve the computer). After this he most likes to play CD-ROM games on his computer, which sits in his mother's bedroom, on her desk. While he often plays Playstation with his younger brother, Carl usually plays computer games alone, sometimes in the evenings and especially on weekends.

Many of the CD-ROM games he plays have violent fantasy themes. Showing a visitor his game collection, Carl narrates their scenarios:

> *Doom 2.* This is a shooter game [i.e. FPS or first-person shooter game]. Basically it's an update of Doom – you get new levels, new monsters, weapons, skies. It has better music, and textures too. And lots of blood and violence. And of course, goat worshipping.
>
> *Dragon's Keep* – in this one you try to defeat the dragon by slaying it with your lance. It's like Skullduggery, the pirate treasure game. There's lots of details.

But not all the CD-ROM games that Carl plays have violent displays, and this is true of the other Elmhurst children as well. He also enjoys more imaginative adventure games, such as *Myst*, that reflect a more patient, ruminative and even bookish approach to problem-solving.

> *Myst* This game is for patient-style people. I like it but [my friend] Andy doesn't. There's lots of puzzles you have to solve and it's fun trying to solve them. First of all, you start on an island called Myst. You read the red and blue books that two brothers left you have to get the red and blue pages. You click around, and there's clues, and you have to find out how to get to all of the pages. There's a lot of answers in the books in the library. This game is one of the hardest games out there and it would take years to beat. Well maybe not years, but a whole lot of months. Maybe even one year.

While Carl does not play them, several Elmhurst children also like popular simulations such as *Sim City, Roller Coaster Arcade*, and *The Sims*. In these games users take an active role in building complex systems (cities, roller coasters, families, respectively), and in manipulating variables to try and sustain them over days and sometimes weeks. None of the children we observed in Southchester used these simulations.

In addition, Carl, like both Southchester and Elmhurst children in the study, also plays educational computer games that his mother has purchased for him, and that often relate directly or indirectly to school curricula and content. Common educational games include typing games and games that focus on states and geography, like *Where in the World is Carmen Sandiego?*

Newgrounds.com: Fantasy game play on the web

Carl, like most of the Elmhurst children (for whom web access is steady) is finding that the web is becoming more interesting to him as a game medium as it evolves more multimedia and interactive forms of gaming. First, he likes to go to sites like Gamesages.com and cheats.ign.com that are places where thousands of gamers post 'cheats' and 'codes' to help each other progress in the challenging, multi-leveled games for Playstation and Nintendo.

Carl' favorite gaming website, Newgrounds.com, was also popular among four other Elmhurst children (three boys and one girl). Children reported playing on Newgrounds in many places – at school, at the library, at friends' houses – but mostly at home. Newgrounds is a portal to thousands of free games and animations, all reflecting a

transgressive adolescent sensibility, usually full of gratuitous violence, and sometimes suggestive sexual content. The site's slogan, trumpeted by a military tank presiding over a cartoon cityscape, is "The problems of the future, today!" It is supported by advertisements, which pop up incessantly, and also by optional pay subscriptions that give access to 'mature' content. But Newgrounds.com is also an example of a responsive, user-driven website. Founded by a young gamer in the mid-1990s, it now features hundreds of user-submitted games and animations, almost all of which are authored by males in their teens and early 20s from around the US. For those who are not young animators or game makers, the site encourages users to submit reviews of games and animations, and participate in bulletin board chats about the games.

Carl likes Newgrounds.com because, he says, "It's basically a lot of cool, dumb stuff." Most of the animated stories and games on the site exude a jeering, mocking attitude toward two targets – first, mainstay figures of popular culture (the actors, singers and celebrities who adults generally believe youngsters admire and want to emulate), and second, the adult world of work and responsibility (to which adults generally hope youngsters will eventually aspire). One of the most popular features on the site is Assassins, a set of games and animations that invite users to "Humiliate and destroy the likes of Britney, NSYNC, Backstreet Boys, Eminem, DBZ, Osama and many other annoying pop culture icons!"

> Carl, 13: Newgrounds is a killing site. You pick a character you don't like, like Barney, and you torture him till he dies. It's funny. You can choose different deaths for Barney – like see him get blown to pieces. Watch this. *[Carl laughs and plays a crude short animation in which the purple dinosaur appears, says 'Let's play, boys and girls,' does a dance, then says 'Let's rest, boys and girls,' sits down on sticks of dynamite, and then explodes, with blood and brains everywhere].* Or you can put him in an oven and watch him get roasted alive.

In their send-up of the adult and media worlds, these stories and graphics resemble online versions of Mad Magazine, though they are far less aesthetically unified and have a cruder and more violent sensibility. "Sick animations" was among the most popular sections of the site. The online games carry the transgressive theme as well.

> Carl, 13: I like to play the games too. This one I really like now is called Skullkid. You're this kid wearing a skull mask

> and you go into an office building and have a shoot-out with the people who work there. They hide behind their desks, and pull out guns. So you have to move around and duck and try to mow them down. It's not too hard, but I do it over and over again anyway - it's hilarious.

For Carl Logan, a quiet, introverted, and church-involved boy, respectful of his mother's and his teachers' authority, it is hard not to speculate that the violent, absurdist materials on Newgrounds.com and similar sites serve partly as a fantasy enactment of impulses that he likes to keep a safe distance away (Hull, J.W. 1985). Compared to the graphic sophistication and realism of Playstation video games, the games and animations that Carl play with on Newgrounds are extremely crude, and slow. But he doesn't care about this because in these games it is the *idea* that counts – mockery of media figures and adult authorities. "The graphics are terrible, and it's so dumb. But I love to sit with [my friend] Andy… we just laugh and laugh. Yesterday we killed Britney Spears."

Gender in middle class children's game play

Gender differences in computer game playing, often remarked on in the literature on children's computing, appear in this study as well, but not in the stark ways often portrayed. Consistent with other research, we found that few girls play the violent FPS (first person shooter) games that most of the boys, like Carl, enjoy. And we found that, in general, the girls are more intensely involved in recreational communication than the boys, perhaps reflecting a greater investment in developing their social identities.

But in Elmhurst, the gender divide is not so stark as it may seem where gaming is concerned. In their game playing Elmhurst children often stepped outside the gender stereotypes of socially involved girls on the one hand, and on the other, boys solipsistically involved with fantasies of violence and aggression.

For example, Newgrounds.com appeared to offer Mark Fleischer, who unlike Carl Logan is a socially confident boy with a large peer network, a degree of distance from images of male attractiveness that he was being encouraged to emulate:

> Mark, 12 [Showing a visitor Newgrounds.com]: This is a fun one. Kill N'Synch. My sister is always saying I look like

> Justin Timberlake – that I should do my hair like his. [From the couch his older sister says: Yeah Mark you should. Girls would be all over you.] But look at these guys, with all that gel. They look stupid. They're not musicians, they're just a bunch of male models. Take that, Justin! [Aims and shoots at a picture of the model/singer, which explodes.]

And Rene Mitchell found *The Sims* to be less about social/emotional relationships between the people she created than about entering a world whose variables she could master and manipulate at will – what might often be typed a 'masculinist' attitude:

> Rene, 12 [Showing a visitor *The Sims*]: Here's my neighborhood. See I have these people over here, they're kind of the poor white trash…. But the main family is over here, they live in a nice house, and I made them Black, just because, I don't know, I wanted to. You can sort of play God. Just make the world different than it is. If you want to be nice to your people you can. You can take care of them, make sure they've got enough education, a good job. Rest and they're eating healthy… Or you can keep them up all night, or have them stay in bed and watch TV all the time... If you make them greedy, then they buy too many things, more than they can afford. They can lose their house… You set up their emotions, too. So they get along with each other good, or when things start going wrong they have lots of fights…. Look at this – once when there was a fire in the kitchen I just let it burn, and watched him [the father in the house] try to deal with it. I made a movie of it, here it is, it's so funny. He doesn't deal with it too well, he just sort of freezes.

This study did not examine children's use of videogames (popular game-box technologies such as X-Box, Nintendo and Sega) but concentrated on their use of computers and the Internet, and the gaming that occurred there. It is possible that, while videogaming per se remains highly gendered, computer and online games, as their designs evolve, may become less so, at least for adolescent boys and girls who use simulations to work out and explore issues of self, self-control, and identity.

Web browsing. Browsing the web was a popular recreational activity for most of the Elmhurst children. The websites they visit most are related to commercial media, entertainment and shopping, and humor. They include MTV.com, FoxKids.com, Gap.com, sites for bands they like, sites about movie and TV celebrities, humor sites like funnyjunk.com. Four children had printed out photographs of favorite pop artists from the web, and two girls had put these pictures up in their bedrooms. Some band sites have

audio clips of music that children play, and some movie sites have movie clips; four children have powerful enough computers, and the right software, to play multimedia clips like these. Children tell each other about these sites during the school day.

> Carl, 12: "I go to freearcade.com to play games, and I like going to sites for the bands I like, like korn.com, blink182.com, and eminem.com."
>
> Ellen, 12: "Someone will say, oh you've got to check out this site I found — the perfectjoke.com, or the internet movie database. We don't really talk about the computer - we just talk about what we saw on it."
>
> Dawn, 12: "Let's see, the sites I go to the most are AOL Teen Chat, Teen.com, MTV.com, Cantdodiddly.com, Z100.com — where I go to my favorite band sites, FoxKids.com, Jennifer Love Hewitt, Screamthemovie.com, Ebay.com — I like to browse all the stuff, Nsync.com."

A subset of children who browse the web for fun use it in a more focused way to pursue personal interests and hobbies in such areas as music, writing, videogame reviewing, robots, chess, books, language learning, and sports. Ellen is one of these children. The list of 'bookmarked' websites she shows a visitor includes several that she returns to regularly because they fuel her interests and hobbies:

> Ellen, 12: "My favorite sites are, ok, Google.com first, 'cause that gets me to any of my interests. Then these soccer websites, they let me see the schedule for the teams we're going to play. These two are kids' writing websites; you can submit stories you write and they might publish them. This songwriting site my teacher gave me. Lyrics.com, OK I love lyrics, and singing along to songs. IMDB, the Internet Movie Database, I like to read about a movie before I rent it. MTV.com. Perfectjoke.com. Mr.biology.home.att.net, that's my teacher's site and you can email him there. Bored.com. Cartoon dolls, that's the doll-making site I told you about. Sites for TV actors I like, like Johnny Depp. Internet Chess. These teen websites, gurls.com and teenpeople.com, they have these quizzes that are dumb but I like to take them, you can see if you score high, like, on relationships with boys. NBA.com and these other sports sites, I go there so I can get scores if I miss the end of the game with my dad. The Importance of Being Earnest, this is a webpage with the whole play, I found it 'cause I love that play. Photography.com — that's my dad's photography webpage."

Children like Ellen, I will argue, are using the web in a way that is significantly different from many of her peers, middle class and working class, These children actively pursue a

range of social, cultural and intellectual interests, and treat the computer and internet as an everyday information appliance that enhances their engagement with things that matter to them. They turn to it throughout the day and week, for recreation and for work, for frivolous entertainment, and for hobbies like music that they take quite seriously.

Multimedia computing using advanced consumer tools

Elmhurst children's recreational computing differed from their working class peers' in another way – it involved much greater use of advanced multimedia tools to gather and manipulate images and sounds. Children in both communities browsed the web for images of pop cultural celebrities and products; and when they could they printed these out, decorating notebooks or bulletin boards, or their bedroom walls. Several Elmhurst and Southchester children had access to newer multimedia computers that came equipped with DVD players, stereo speakers and faster processors capable of dealing with audio and video content on the web. But Elmhurst children were far more likely to spend time using these digital tools in ways then being promoted by the computing industry –finding and downloading music files, creating web pages, taking digital family photos.

Downloading digital music files is a popular activity for four of the ten Elmhurst children. The web-based audio tool Napster was a very popular file-sharing utility during this research, and articles about its use and abuse were prevalent throughout the period.

> Lucy, 12, showing her 60 or so music files: "[The Napster] Library is my favorite — it's where all my songs are stored. They're alphabetical - most of my songs start with I for Insync [sic]." She pulls up a track and plays it and the music comes pulsing out of the multimedia speakers. "This is their latest song. It's from their new CD, that's not out yet."

Five children use Napster to find and download songs they like from the web. Children were taught to use Napster by older siblings, friends, and sometimes by parents or other relatives. In two families children download songs as part of family gatherings, in others they do so privately or with friends. One child used a CD burner and Adaptec software to create mix CDs for two friends.

Six of ten children use their home computers to capture and manipulate images and audio files. Five children have created digital pictures using a digital camera or scanner, and manipulated them using graphic software like Photoshop and Barbie Photo Designer. Three children helped parents or siblings put family photographs onto their computer as screensavers and as a way to share them with relatives, via email. Two children used graphics software to open and resize celebrity photos they had gotten from the web, before putting them on their bedroom walls. One girl recorded audio messages with her brother and sent them to friends during IM sessions. Four used simple graphics software like Greetings Workshop, Windows Paint, and Disney Art Studio to create birthday and holiday cards and send them to friends and relatives.

Most children use these consumer-level image and audio tools for informal family communications and entertainment. Three, however, created more polished presentations using the features of these tools. Tucker Verderame helped his father create and run a PowerPoint slideshow for a Manhattan event that the father (owner of a media production company) was working on. Two others created PowerPoint presentations for their social studies class that were organized nonlinearly and used graphic and audio elements to deliberate effect.

> Ellen, 12: "Usually when kids do PowerPoint they just have a slideshow playing. You just press buttons, you don't get to perform what you know. But I like to speak. I like drama too. So we did [a presentation] where we stood at the front of the class, and played music with each slide, and then spoke over it."

Finally, three out of ten children have created their own homepage using AOL templates, which make the process very easy. The pages consisted of basic personal information, like favorite music and websites, and in one case, original poetry. Mark Fleischer built a webpage, 'EMS Sucks', that allows kids to post gossip about their middle school online. However simple, these pages are ways that the middle class children are beginning to represent themselves within the digital medium.

b. School-related computing in Elmhurst

Like children in Southchester, the Elmhurst children regularly use their computer for school-related tasks, at least once every two weeks. Though most (8 of 10) spend more time in recreational computing overall, school still occupies an important place in their home computing. All say that school-related uses move to the forefront at times when reports or major assignments are due. About half the middle class children do school-related computing that mirrors the Southchester children's, in that it is limited to two common tasks – typing reports and homework assignments, and occasionally looking for information on the web. They fit their homework in around their recreational computing, rather than the other way around.

> Dawn, 12: "I usually type my homework in the morning before school, when my friends aren't IMing. I don't want to miss anything."

However the other half of the Elmhurst children – those in the upper track in their middle school, and a boy being home-schooled – also use the computer and Internet for more in-depth educational projects that involve the manipulation and analysis of information of various kinds.

Ellen Wagner and Rene Mitchell, for example, both completed a year-long stock-watch simulation for their 7th grade social studies class. For this assignment they were given $50,000. in virtual money and asked to pick real stocks for a virtual portfolio, then follow its value all year using financial websites and the newspaper. Near the end of the year they wrote a report summarizing the stock's performance, and any earnings or losses they had. In an email about the project, Ellen is clear about both the value of web information in the stock projects, and the likely role of stock in her own life:

> Ellen, 12, in an email: "Mrs. Wiggins, my math teacher, assigned [the stock activity] towards the beginning of the year. Our goal was to pick two stocks that we thought would earn us money. We recorded the stock's information about once every month, or went back to a month using the historical quote function on the website. Our goal was to gather enough information to write our paper, and draw a graph. Stocks are a great way to study math; we had to figure means, medians, and modes, all of which we were reviewing that year. I know that stocks could be a major part of my life later, and it was helpful to learn about how they work and make us money."

In another example of cognitively rich computing, Rene Mitchell showed researchers an elaborate science fair presentation on "Painful Packs" in which she used the spreadsheet software Excel and a graphics program to summarize data from a survey of backpack weights and back pain experienced by fellow students.

> Rene's science fair project, "Painful Packs" is on display in the living room. It's a big tri-fold poster board that colorfully summarizes a survey she and a partner gave to 157 students. It analyzes their reported backpack weights, body weight and back pain. Included are three charts summarizing the data that Rene made with Excel. I later find out that Barbara, Rene's mother, helped to spell-check the report the night before it was due, and also helped Rene in using Excel. [Fieldnote]

Cole Griffin is being home-schooled by his mother and has a lot of studying to do at home, in addition to pursuing his video and computer game passions, which his younger brother Mark shares. To Cole and his mother, the web appears to be an ideal medium for home-schoolers:

> Carla Griffin: "We've visited the whole world. There's so much information. We can hear French radio to reinforce our French. There are books online. We can read the Constitution, or the Declaration of Independence. We study the Amendments and look right at them."

Cole and his younger brother are largely self-taught on the computer. When their mother bought a new computer to use for her business and for their schooling, she wanted to take a course or have someone come in and teach them how to set it up and use it. Instead, Cole and Mark sat her down and taught her, as well as themselves, how to use it, going chapter by chapter through a computer book they got at Barnes and Noble, and consulting the manual when necessary. Cole pursues these auto-didactic habits as a home-schooler, taking a course in Japanese via the computer, learning about programming, and studying topics and questions his mother has assigned him by using websites she has identified ahead of time as appropriate. One of his mother's assignments asked Cole to say which events led to American involvement in the Vietnam War. Cole showed researchers a folder titled 'Vietnam' that he said he presented to his mother in answering the question. In it there is a typed page titled 'US-Vietnam War' that lists several subtopics: 'French Indo-China War,' 'WWII -- anti-communism, 'Cold War with Russia', 'domino theory.'

Following this there were printouts of webpages Cole had found related to the subtopics, including a map of Indochina, a wikepedia article on Vietnam's history, a long memoir by a US soldier, President Kennedy's inaugural address, a page of text about the Tonkin Gulf incident, another wikepedia article about the domino theory, and three well-known photographs, of a Buddhist monk aflame, a naked Vietnamese girl running, and a soldier with a peace symbol around his neck. Cole narrates the following story to explain the items he has collected:

> I had to keep pushing back. The first thing I found out was that the Vietnam War wasn't the start. It was French before - they were fighting there. After World War II. Why? Cause they wanted to control it. They called it – what was it [Looks at the folder] - French Indo-China… Way before there wasn't even any North or South Vietnam, it was just Vietnam. They saw it that way – the people there. We thought… I read it's in the Cold War. I didn't know what that was so my mom said go back and find out. It's us against Russia. It was about communism, like Hitler had. Which is stupid cause in World War II Russia and us were both fighting Hitler. So why did they change? Anyway in communism it's supposed to be equal, but they control everything… So they wanted to get more countries, and we didn't want them to. But we lied – this boat that Kennedy said was hit wasn't hit… And we bombed a lot and lots of people were killed, or hurt, like this girl…

Cole's account of the origins of the Vietnam War is rambling and factually incorrect in some details, but for an eighth grader it reflects far greater awareness of the global origins of the war, and of a wider set of source materials, than most high school students would likely get from their textbooks or from teachers. For Cole, and for a subset of the other Elmhurst children, the web as an educational medium can sometimes enable, richer, deeper and more real-world inquiries than they would be able to pursue otherwise.

c. Creative recreational computing

A final category of Elmhurst children's computing that deserves mention is 'creative recreational computing.' Four children stand out in their recreational computing because they engage in in-depth, creative projects using the computer. These projects are unconnected to school, yet the children pursue them with an intensity and commitment much greater than they devote to the casual IMing, game playing and web browsing that,

along with all the children in the study, they otherwise pursue. The projects often occupy hours and a time, and continue over weeks and sometimes months. These four children – Cole Griffin, Ellen Wagner, Tucker Verderame and Rene Mitchell – all describe themselves as less bored than their peers, and sometimes (as in the case of Tucker) they describe themselves as less bored *because of* their creative projects with the computer. We will explore the family and parental circumstances of these children further in the next chapters; for now it is enough to say that in each case, though their creative projects are self-initiated, these children otherwise benefit from a great deal of parental monitoring, investment and support.

Cole Griffin, who is being home-schooled, maintains his own web pages devoted to the electronic games he loves, hoping they will attract the sponsorship of the gaming companies. He regularly emails the hosts of similar sites, and contributes game reviews to their sites. All told, his own site has registered 1,123 hits during the time of the research — something Cole is proud of.

> Cole, 13: "This is the gaming site….[types in www.geocities.com/gamingzone2002] I wrote all the reviews. Here's my review for Guilty Gear X. This is the best one I ever wrote, because I wrote in paragraphs. And I had the set-up [layout] nice, with the pictures, and the text all put together."

Ellen Wagner, who is involved with music in multiple ways both in school and out, composes songs using a music-writing program her mother gave her as a present, types her poems and lyrics using MS Word, and visits websites devoted to songwriting and song lyrics in order to get ideas.

> Ellen, 12: "Sometimes if I like a song we're doing in chorus or something I'll borrow the sheet music from the teacher and then copy it into this [Midisoft Desktop Music 2000]. It takes about an hour, but it's worth it. Cause I can play the parts back, one part at a time. So for the tricky rhythms I can see what the left hand's doing, what the right hand's doing on the piano."

Tucker Verderame and his best friend say they were bored every day after school playing video games until they found several websites devoted to *BattleBots*, their favorite television show, and began building their own robot to enter into competition. Guided by

information posted on the websites, they created an initial robot design, then revised it as they built the robot piece by piece in Ben's basement. They used a spreadsheet to keep a budget for the money raised from neighbors and parents' co-workers, used a computer-aided-design program to make more elaborate 3-D drawings of their robot, and queried design experts on the websites when they needed help with a mechanical or design problem.

> Tucker, 13: "Building the robot has been going great. We found this program called Rhino 3-D, it's a 3-D design program and it let us design the body in 3D. To buy the CD-ROM costs 739 bucks, so we downloaded it on the web. It's better than Auto-CAD for us; with auto-CAD you can only design stuff in two dimensions — width and height. In Rhino, you can see the design from four different points of view. We saved the file, the different views, and we printed them out. It's helped us see what the bot's going to look like, and how to make changes."

Not all creative recreational computing by middle class children involved sophisticated uses of the medium; some of it was surprisingly 'low-tech', as children drew on the computer mainly as a resource for dramatic play. Rene Mitchell and her little sister Jenn like to play endless games of 'office' using their computer more or less as a typewriter, and sometimes as an imaginary data terminal. The occupational fantasies varied – they might be an airline reservations agent, or social a worker, a dentist, or a teacher. In these games the sisters took on roles of worker and client, with one at the keyboard typing up answers supplied by the other. Or Rene would type up a made-up form, print it out, and interview her sister with a clipboard. A typical made-up form (reproduced here as Rene typed it) consists of the following:

Continental Airlines Reservations Form

Your Name: _____
Street: _____
City, State, Zip: _____
Phone number_____

Destination you want to travel to: _____
Day you want to leave: _____
Time you want to leave: _____
Stops you want, or non-stop? _____

Reason for going: vacation job visit someone sick

Day you want to come back: _____
Time you want to leave: _____

Aisle seat or window seat? _____
Special food you need: _____

Are you afraid of flying? Yes - why? _____
No

Computer reservation number: _____

THANK YOU FOR FYLING WITH CONTINENTAL AIRLINES!

In games like these Rene and her sister are treating the computer as more than a typewriter. Symbolically, it is a feature of the adult occupational landscape, and more, it is a bureaucratic tool used to gather and sort information in efficient ways to make decisions. In another of her occupational role-plays, described by Rene's mother, Rene plays a counselor doing an intake interview. She interviews her sister, father and mother, asking questions about their reasons for seeking counseling, their mental health in the past, their current symptoms. She then goes to the computer to 'enter' the data she had gathered, and 'look up' recommendations about whether the patient should be admitted to a hospital, given medication, or seen for counseling.

Summary: Southchester and Elmhurst children's home computing

In this Chapter we have summarized some of the broad distinguishing characteristics of Southchester and Elmhurst children's computing. Southchester children use their computers less than their Elmhurst peers, mostly for simple school-related tasks like typing reports and finding information on the web, but also for playing computer games and browsing the web for commercial and pop cultural information. Their use of the Internet is less developed than the Elmhurst children's, partly because of inconsistent Internet connectivity.

However we noted that Southchester children and families do not use their home computers in uniform ways. A handful of Southchester children, all children of immigrants, engage in practical-informational computing that helps connect them and their families to people and opportunities beyond home and school. On the other hand, two of the Southchester children, both in highly stressed households, spend long hours in unsupervised exchanges of with peers and adult strangers. In these homes, children's use of the Internet appears to be part of a wider pattern of media use as distraction or escape from difficult family circumstances.

Elmhurst children use the computer more robustly than their peers in Southchester. Varied uses of the computer and Internet are integrated into their day-to-day lives. Children get home from school and go online to chat with friends; come back after dinner to type a report; run downstairs to find and printout lyrics to a song playing on the radio in their room, and check the weather before bedtime to see what to wear the next day. For them, the computer is first and foremost a recreational medium, and they spend most of their time online in informal communication with peers, through Instant Messaging and online chat rooms. They play games more intensively than the Southchester children as well, including online games and simulations.

As in Southchester however, not all Elmhurst children use the computer and Internet in the same ways. High-track students work on homework assignments that are sometimes

cognitively demanding, and that use the computer to access, analyze and present more complex kinds of information than the routine word processing and information-finding tasks that lower-track children, like their Southchester counterparts, typically get. In addition, a subset of Elmhurst children engage in creative computing tasks like building a robot, composing music and building and hosting a website devoted to reviews of computer games.

In addition to these differences in the *content* of home computing, we noted several distinguishing features of *the way home computing happened* in the two communities:

- Southchester children tend to use the computer when other family members are present, often during evenings or weekends. They also tend to help one another, including their parents, with computing tasks that have practical utility, such as creating a flyer for a church event. Elmhurst children, in contrast, tend to use the computer and Internet by themselves, in periods of time (such as after school) and in physical spaces that afford them greater privacy.

- Elmhurst children often appear to use the computer and Internet to cope with the boredom they experience when at home without organized activities. In the case of several Elmhurst children we observed online behaviors considered inappropriate by most child advocates and parents, such as harassment of others in chat rooms and private messaging. Southchester children, far less involved in online communications, were not observed engaging in these behaviors, and for the most part they did not express the same sense of boredom at home.

- Family conflict around the computer and Internet – between siblings and between children and parents – was a regular feature of Elmhurst households, and was far less common in Southchester, even though in Southchester there were more siblings sharing a computer.

- Finally we began to see some of the differences in computer skill and confidence that Elmhurst and Southchester children displayed. Southchester children were developing a relatively narrow set of skills -- typing, browsing for information and simple game-playing, while Elmhurst children were developing fluency with a wider set of tools, for a wider set of purposes. Because these differences in children's technological literacies are plausibly related to future educational and career outcomes, they are discussed in greater depth in Chapter Five.

Before looking at the technology skills that children are developing, however, it is important to anticipate a question about the broad differences in usage we have seen in this chapter. It is possible this chapter has merely sketched the contours of two types of users – robust users (in Elmhurst) and emergent users (in Southchester). If the differences in use described in this chapter are a mainly function of how long computers have been in homes in the two communities, they may simply disappear over time of their own accord, with the greater diffusion of computers into low-income homes, and the greater experience that children and families have with them. (This belief is the essence the market-based philosophy that was skeptical about the 'digital divide' throughout the 90s, and which has been ascendant in policy circles since the dot-com bust.)

In order to consider the merits of this idea, we need to look more closely at the structural circumstances of communities, households and families, in which these uses arise. These economic and social circumstances are the subject of Chapter Four.

Chapter Four

Structural Circumstances
Shaping Computer Use in Southchester and Elmhurst

The differences in children's computing that we observed in middle and working class homes, and the consequences that follow from them, do not simply arise from the computers themselves, the software on them, nor the training and preparation that children and families had. Differences in children's computing are rooted partly in the economic, social and educational circumstances of the two communities. This chapter describes specific circumstances – economic, social, educational -- that shaped children's computing, and considers the twin possibilities that inequalities in these areas will be amplified, or conversely meliorated, by children's use of digital technologies.

I discuss seven factors that appear to affect children's computing in important ways. First, *the quality of access to computing resources* differed in the two communities in important ways, though not as portrayed in popular images of 'technology haves and have-nots.' Second, *parental resources* for supporting children's computing differed significantly in the two communities, with the Elmhurst parents generally bringing much more knowledge and skill to the table, often from job-based experiences, than did the Southchester parents. (The key role of parents and parenting in shaping children's lives at home, including their computing and its consequences, will be discussed in detail in Chapter Six.) Another finding of this study is that the *help-getting resources* that middle and low-income families had access to was very different. Additional important factors were the *size and organization of homes*, and the number of people living in them, for these influenced where the computer was located and how it was used by children. *The schools* in the two communities influenced children's home computing in important ways as well, as the Elmhurst schools sent home assignments that occasionally asked children to use and evaluate information critically, and Southchester's schools asked for information retrieval and scribal typing tasks. *Gender relationships* in the households also influenced children's computing, with the somewhat more traditional relationships in the Southchester homes sometimes having consequences for children's access to and use

of the computer and Internet. Finally, *wider community resources* also shaped children's home computing, as Elmhurst children drew on the resources of well-connected local institutions like libraries and Internet cafés with knowledgeable adults in them, and Southchester children lacked these advantages, partly because their community did not have them, and partly because neighborhood crime made it difficult for them to use them.

1. The quality of access to computing in Elmhurst and Southchester

As mentioned when discussing time differences in computer use, the technology access enjoyed by families in the two communities differed in ways that shaped the uses children made of them. In Elmhurst, six of ten families had two or more working computers at home (two families had three, and two families had four). Nearly all families (nine of ten) had at least one powerful Pentium machine bought in the last three years. Families typically designated their most powerful networked machine the "family computer" and put it in a shared space such as living room, den, or guest room. Families with multiple computers typically regard the others as belonging to a parent (e.g., "dad's laptop," used for work), and/or as "the old computer," which they often put in a child's bedroom or basement, where it is used for games. For the most part, computers and the Internet are not recent arrivals in these households. Seven of ten families have had a computer for more than five years, and nine of ten have had Internet access for at least two years. Families pay an average of $30 dollars a month for Internet service, usually through America Online (AOL). One family has broadband network access through a cable modem. More than half the families have separate telephone lines for their Internet-connected computers, enabling family members to use the phone and the Internet at the same time. As a result, eight of ten of these families had fairly robust and stable computer and Internet access during the period of the study.

In addition, parents in these families continually invest in technology, for their children as well as themselves: they shop for upgrades to new machines (three families had upgraded to powerful multimedia computers in the six months prior to the research, and one bought a new computer during the research); they buy laser printers or scanners or digital cameras they think will add value to what they already have; they browse software

racks in stores looking for titles that might be good for learning or for fun or for practical tasks.

In contrast, working class Southchester children often had an intermittent connection to the Internet, usually via one donated computer that they had to share with siblings (see above, figure 3.2). While the computer they received from TAA was a relatively robust model (a Pentium-level micro-processor with CD-ROM drive, floppy drive, and 56kb modem, outfitted with the MS Windows 98 operating system, MS Office 2000, and CyberSitter 2000), families had recurrent problems communicating with the low-cost Internet Service Provider (ISP) that TAA found for them, and the result for many was that their Internet service was discontinued for weeks or months at a time. Many of the Southchester families, like their Elmhurst counterparts, purchased additional items for their computers, including a desk designed to hold the computer, hardware peripherals (e.g., keyboards, mice, printers, speakers) and software.

A key result of these differences was that Elmhurst children, whenever they wanted it, were much more likely than their Southchester peers to find a working, Internet-connected computer available for their use at home.[6]

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[6] *Technology in low-income households: getting beyond myth of 'info-tech have-nots'* This said, the Southchester families had a history of technology ownership and use that pre-dates TAA's donation of a computer. This history helps serve as a corrective to the myth of 'no access' in low-income homes.

The literature on the digital divide typically characterizes low-income households as 'information technology have-nots', meaning that they lack the computer hardware, software and internet connectivity necessary to access the flows of information that purportedly enable and/or disallow participation and advancement in society. But computer technologies are not a new a presence in the lives of these low-income children and their families. Rather than a stark lack of access, we see a much more varied picture, one that reflects in part poor families' longstanding interest in technologies, their belief in the value of technology for their children, and also, an abiding American passion for high-tech and media gadgetry.

First, computers are not brand new arrivals in most of these low-income, immigrant households. Of the ten low-income families, seven had acquired a home computer in the 1-6 years prior to getting their TAA computer. In two households the pre-TAA computer was broken at the time of the study, and was stored in a closet.[6] In one home the pre-TAA computer was working at the time of the study, but not connected to the Internet. But in three households -- a third of the low-income sample -- a computer other than the TAA computer was working and connected to the Internet at the time of the study. Most of these computers had been acquired during the prior 2-3 years, but in two families computers had been part of the household for 4-6 years.

2. The parental skill gap: The role of middle class work settings

A substantial gulf existed between the working and middle-class parents when it came to experience with computers and the Internet, and as we will see, in this gap in experience influenced the kinds of involvement parents had in their children's computing (Chapter Six), and also the kinds of skills children were developing (Chapter Five). Elmhurst parents, as a group, had themselves had far longer experience with computers than their Southchester peers; their experience typically went back 10 or more years, while the Southchester parents described five or fewer years of computer experience, if they had any at all.

More important than simple length of time, however, was the range of experiences Elmhurst parents brought – a mixture of leisure-related, and increasingly work-related,

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Internet connectivity, however, *was* new to most of these households. Six of nine homes had not had Internet access until TAA gave them a connection along with the computer. The three families that did have home Internet access before their involvement with TAA did not have it long. Like a large number of Americans, they had acquired their home Internet connection within the previous two years.

Beyond their interest in their children's education, there was some evidence that adults in these families had their own interests and investments in digital technologies. While most adults had used their home computers relatively little, parents in two of the nine homes were pronounced technophiles. Both were fathers whose interest and involvement in computers predated and surpassed their children's. One father worked for a large telecommunication company and kept a den in which he alone was allowed to go, filled with high-tech gadgets including a new internet-connected laptop, CD player and speakers, DVD player, and CD burner, which he used to make his own recordings. The other father worked in a bodega but had fallen in love with tinkering with electronics while a youngster in Puerto Rico, had maintained an interest and taught himself to build his own computer from scratch, and was now repairing and selling broken laptops from his home, as an extra source of income.

Yet despite their history of owning and using computer technologies, these families did not, for the most part, have *quality* access to technology prior to getting their TAA computer. Meaningful or 'quality' home access, as Becker (2000) claims, requires several things -- a computer with sufficient processor speed, memory and graphics capability to display current CD-ROM and web content, the software to work with this material, a reliable internet connection, and peripherals such as a printer. Few families had a reliable combination of these elements in their homes for any period of time. (In fact, even after receiving their TAA computer and Internet hook-up, many families experienced problems with one or more of these elements, and as a result had highly unstable and intermittent Internet access, as we will see.) Nevertheless, the history of computer ownership among these households reminds us that low-income Americans are not a 'blank slate' when it comes to information technology. Well before the late 1990s period of dot-com excitement and governmental and private concern over low-income Americans' lack of access, these families were purchasing, and using, computer technology. What lessons they took from their initial experiences with home computing, will be discussed below, in Chapter Five.

uses. Whereas earlier studies have found a general lack of computer skill on the part of middle class parents (one that contributed to a lack of parental involvement in children's computing – see Giacquinta, 1993), this study documents a different trend: middle class adults' increasing fluency with a range of computer and Internet applications, deriving largely from computerized work settings, but also from new varieties of leisure computing.

In seven of the ten Elmhurst households, at least one parent used computers in their day-to-day work in ways that were non-trivial – that is, that involved more than word processing or simple data access – and were integral to the accomplishment of core professional tasks. Terence Christian, an African American writer for a metropolitan magazine, took notes on a laptop just after his interviews, used email as well as the phone to set up interviews, traded and edited electronic drafts of stories with his editors, and submitted the final story electronically. Karen Griffin, a financial planner, used the Web to access current financial performance data, and figured clients' investment and savings options using a spreadsheet and calculator. Roland Mitchell constantly used email to connect with his advertising clients, and wrote speeches and designed websites for them using multimedia software tools. As legal and medical secretaries, Lucy Smithson's and Mark Fleischer's mothers used the computer for core document-handling tasks, (though unlike many of the middle class parents they tended to leave their work at work). Morgan Gillette, before she was laid off as a commercial designer, prepared graphic presentations and layouts for all kinds of print and commercial applications to a wide range of clients. Finally, Jerry Verderame, in his media production company, used CAD software, as well as a host of other digital tools, to produce video, audio and digital productions; he also used spreadsheets, calendar tools and collaborative meeting tools to plan and manage projects and budgets.

At least two aspects of these technology-infused work settings had important consequences for children and the computing that happened at home. First, parents brought home far more than discrete skills with this or that software application – they brought home working familiarity with a range of technology applications, and hence an

orientation toward technology as a flexible information tool. Their information-heavy jobs involved using databases, spreadsheets, graphic design tools, document tracking tools, communications programs (like email and web conferencing), collaborative scheduling programs, and multimedia presentation software, and they used these on a daily basis in interaction with others; the tools were hence deeply embedded in social settings of judgment, decision making, communication and problem-solving. As I will discuss in Chapter Six, this led some middle-class parents to deal in distinctive ways with their children when it came to media and the computer, reproducing in their children the flexible 'information orientation' they themselves had acquired.

Technology-infused work settings had a second consequence for middle class families: they helped contribute to the blurring of boundaries between work life and home life. Parents in nearly all the middle class homes routinely did work at home, usually in the evening hours, and often on weekends. This was true both for the mostly male parents who commuted some distance to white collar jobs, and also for the usually female parents who were teachers and part-time workers close-by. Seven of the ten Elmhurst families had an area of the house marked off for parental work on a computer, variously dubbed 'the office,' 'the den,' 'Mom's/Dad's computer room,' or 'the computer room.' In five homes parent and child computing frequently occurred in the same space, either on the same or on adjacent computers. In these households children routinely saw parents working on the computer during and between other household activities, saw them getting frustrated and angry when overloaded by simultaneous work and family tasks, watched them deal with technical problems, heard them argue and negotiate about when the computer was used, and for how long, and participated actively in arguments about sharing the computer. Again, I will argue in Chapter Six that these experiences were important kinds of 'collateral learning' for children in middle class homes.

In the Southchester families, by contrast, with a few exceptions, parents had less computer knowledge and experience than their children. Many had acquired a home computer previously, but had not used computers extensively in work settings, or in interest-driven pursuits. Few Southchester parents used computers in their work in ways

that were integral to their work roles and duties. Luz Cabrera's mother did translations for a Spanish-language newspaper, but even here her daughter helped her with what were essentially word processing tasks. Luz's father worked as an administrator for AARP, and at one point had even run a community center that offered access to computers, but he did not live at home with the children and his greater knowledge of computing appeared to have little impact on Luz or her siblings. Southchester parents as a whole were thus at a more exploratory, learning stage of computer use, with the TAA training an important introduction for many of them. As a result, parents were more reliant on siblings, teachers, and others to introduce and guide their children through different kinds of computing.

3. Trouble-shooting resources of families and social networks

Personal computers are notoriously fussy technologies, and when they are connected to a network they are even more so. Families with home computers routinely cope with system crashes and memory limitations, connection problems between peripherals, difficulties with software installation and using software, and unstable network connectivity (Kiesler et al, 2000). The skills, knowledge and attitudes needed to deal with this ever-unstable technical interface constitute 'troubleshooting' literacy. They include not only the knowledge and confidence to try and fix a problem oneself, but also the inclination and ability to get help from others, including those in or near the household, or remote technical support professionals. Research suggests that knowledge and help-getting are mutually reinforcing – people ask for and get help more often when they have knowledge and experience with computers, and are often inhibited in doing so when they lack knowledge and experience, and sometimes stop using the computer altogether (Kiesler et al, 2000). This suggests that families in which technologies are a new addition, and in which little prior experience resides (e.g., many low-income homes), will be easily disabled by even minor problems. It also suggests, however, that if even one individual in the household has experience and confidence to try addressing a problem, this person may be on the way to becoming the 'computer guru', seeking outside help channeling knowledge to other family members. Kiesler et al (2000) found that the family member who emerged as the computer guru in the households they

studied was often the teenager who spent the most time in the household online, leading sometimes to benefits for other members of the household (shared knowledge and skills) and sometimes to barriers (monopolized computer time and highly personalized computer settings).

In our study, the technical expertise of friends, relatives, and neighbors differed in the two communities. The middle-income families often had friends, relatives, or neighbors with strong technology skills who could help them troubleshoot computer problems. Low-income families were less likely to know people with such skills and so turned to schoolteachers and to TAA for help.

The challenge of maintaining a working computer with a network connection was different in the two communities, partly due to the financial resources families brought to bear, but also due to the confidence and skill with which they dealt with technical service providers. Southchester families had much greater difficulty maintaining a working computer and a consistent Internet connection than did the Elmhurst families. Most Elmhurst families had purchased their own computer and used America Online; they paid automatically for their Internet service through their credit card each month. While technical problems occasionally arose, their Internet service was fairly reliable and consistent. The Southchester families, initially given a powerful computer and three free months of internet service by a smaller provider, had difficulty paying even their low monthly bills after the initial free period – in part because they lacked credit cards and the experience of getting and paying invoices electronically.

Middle-income children in Elmhurst were more likely to troubleshoot technical problems on their own with success, and this in turn appeared to be related to the amount and quality of technology expertise that resided close at hand, among parents, older siblings, and extended family members. The adage that successful use of a personal computer depends on "how close you are to a nerd" seems to hold true for these families, who are all only one or two steps removed from someone they characterize as "a computer expert," and who regularly helps them navigate the software and hardware snags that

arise persistently for everyone. The availability of such knowledge and expertise in their immediate family and social networks is rooted in social class factors of employment and education; parents and extended family members encounter computers and computer troubleshooting in their work lives, in their schooling, and often in their hobbies. Even when they do not have such experience, high levels of literacy and experiences of efficacy make them relatively comfortable reading manuals, and asking others for help using whatever language they have available. These activities, in turn, model troubleshooting habits and attitudes for their children.

4. Size of homes and households, and number of computers

The size of homes, the size of households, and the number of computers in the home differed across the two communities. These had a powerful indirect influence on how children used computers and the Internet, for they influenced the location, hours and relative privacy children enjoyed when using the computer. The working class Southchester homes typically had only one computer located in a heavily trafficked area, such as the living room, hallway or kitchen. When it was located in a bedroom, the bedroom was mostly likely shared by at two or three children, because of the larger family sizes in Southchester. As a result, the children's activities online were more often shared with other family members, and sometimes observed by parents who were likely to encourage school-related computing and discourage recreational computing. In the larger middle-income homes, by contrast, multiple computers were typically spread out in different locations including dens, basements, attics and bedrooms, allowing children more privacy in using the medium. As a result, there tended to be less social interaction around the computer than in Southchester homes, and children were freer to use them for recreational purposes unhindered by parents. Some middle class parents responded by self-consciously placing the computer in more 'public' settings so they could at least try to monitor and limit children's uses, but others did not, a difference that will be explored more deeply in Chapter Six.

5. School Advantage: School contexts of computing in Elmhurst and Southchester

The role that the schools played in fostering robust computer and critical thinking skills also emerged as an important issue. While the scope of the study did not allow us to gather data at children's schools, we looked at assignments children in the different middle schools were given, and we asked children to describe any direct instruction they had received about computer at school. Based on these data, school expectations for children's computing seem to differ in subtle but important ways in the two communities.

In all the schools, teachers assigned homework that called for children to use the computer outside school. In Southchester, teachers assigned homework requiring Internet research and give extra credit for typed reports. In Elmhurst, teachers' assignments were often quite similar, with some important exceptions. Teachers in some middle track classes, and in all high-track classes, assigned longer-term projects that called for more in-depth and critical use of information resources. These included stock market simulations (where children were given a certain amount of money to 'buy' stocks, and used web-based tools to track and graph the performance of their portfolio over an entire semester); web-quests (multi-part tasks that asked children to gather and synthesize information from a range of webpages); and science research projects (where children had to do an original experiment and put their findings in the context of previous studies). As we will see in the following chapter on children's literacies, these kinds of longer-term assignments had important consequences for the way some middle class children came to understand the computer as an information tool.

Schools in Southchester and Elmhurst also differed in the amount and kind of direct instruction they provided to children in using the computer. Generally speaking, the ASE and PAC schools in Southchester focused on teaching *how* to use a computer, and encouraging basic computer uses for their own sake. Elmhurst middle schools, by contrast, focused on teaching students how to accomplish different kinds of information tasks; in these tasks the computer functioned as a tool rather than an end in itself. This distinction, between viewing computer learning as an end in itself (i.e., as generalized preparation for a computerized world of work), and as a tool for accomplishing a variety

of intellectual and practical ends, has a long history in educational technology discourse (Sheffler, 1986).

In Southchester, students were taught how to use specific applications, and were sent to specific websites to find information. The science and computer teacher at ASE, for example, taught students MS Word so that they could type their homework, and for homework asked them to go to weather.com and copy down the weather in specific cities. Students were not taught how to approach open-ended information tasks that required them to make judgments and decisions about the information they encountered (for example, they were not asked to decide *which* cities would be good to use as data points for answering a larger question about weather). Nor were they taught how to use powerful, flexible tools like Internet search engines. In the Elmhurst schools, by contrast, students were helped to use the computer both by individual classroom teachers and also by school librarians. For example, as we have noted, a math teacher showed students how to track changing stock prices over time. Meanwhile, school librarians taught Internet search skills to entire classes, and this training included discussion about how to evaluate the information they found.

Interviews with parents, TAA administrators, and the several Elmhurst participants who were teachers in local schools, suggests reasons why computer instruction looked as different as it did. First and foremost were the educational visions surrounding computer use in the two school.' ASE and PAC administrators, in working with TAA to provide computers to all students and teachers, saw them as important first and foremost for the 'equal access' they provided. More important than any particular use of the new technology was the simple fact that children had, and were using, the new technology. Their function was, in other words, highly symbolic. Second, administrators and teachers saw the computers as an important link between students and staff who, now that they were connected via email, would function more as a 'community.' Missing here was an *instructional* vision – a notion of how computers fit into, and supported, teaching and learning. Computers were a new kind of 'content' or 'skill area', and little more.

Elmhurst schools, in contrast, have long struggled to integrate computers into instruction, though as is often the case, they have had uneven success. District policy specifies that technology must serve curricular objectives -- "Technology is to be viewed as a tool to enhance the learning process among other tools that are required for teachers and students to fully explore the curriculum" (Elmhurst Schools, 2002) -- and the types of assignments we documented during the study suggest that this is more than mere administrative rhetoric. Elmhurst teachers incorporated computers in varied ways: science and social studies teachers had their own websites posting homework and assignments, some of which were web-based, math teachers modeled assignments on real-world uses of spreadsheets, librarians taught 'information literacy,' art teachers encouraged students to pursue their interests in animation, computer art and video. While no single interpretation of the proper role of computers in teaching or learning held sway in Elmhurst, the notion that the computer was an *information tool* was implict in these uses, and children were cumulatively exposed to this idea.

As with the development of any human capital, when it comes to technology skills an interaction occurs between schools and families. This interaction can be at cross purposes, without coordination, or in concert. For many Elmhurst children, school and home were basically pushing in the same direction. Library and media staff were teaching students how to do searches and how to cite and evaluate material. Some parents were also talking about some of these issues at home. In high-track classes teachers gave assignments suck as stock-market simulations that called for more robust and cognitively demanding use the Internet as an information resource, tasks that mirrored many of those that middle class parents were pursuing in their home offices. Meanwhile, in Southchester, school and home were also pushing in the same direction -- toward getting homework done, where homework consisted of simple, short-term 'scribal' tasks.

6. Gender and household computing

Most prior literature on children's computing – including their home computing – has stressed the importance of gender as a shaping influence in children's activities. Studies have frequently described computing situations in which boys display, or are accorded,

greater control, risk-taking and efficacy with technology in comparison to girls, who are display or are accorded relative passivity, inaction and rule-following (Cassell & Jenkins, 1998; Lips & Temple, 1990; Shade, 1994; Solvberg, 2002).

I found that gender was far less a factor in the intensity and content of children's computing than prior studies led me to expect. However, gender did play some role in shaping the circumstances of children's computing, mostly through gender-based parental dynamics. First I will describe the relative lack of gender differences in children's computing, then the gender dynamics around the computer observed among parents in some families, and how it seemed to affect children.

In both working and middle class homes, boys and girls used the computer and Internet (or did not use them) in roughly equal measure; and where differences emerged, they often confounded gender expectations. For example, in Southchester, three of the four heaviest computer users were girls, not boys. And in Elmhurst, among the seven heaviest users, four were girls and three were boys. (It should be remembered, however, that girls outnumbered boys in our sample by 6 to 4 in both cohorts.)

There was also remarkable degree of overlap in the content of boys' and girls' home computing. To begin with, in each community, boys and girls mixed recreational and school-related computing to largely the same extent. In Elmhurst, where recreational computing trumped school computing, nearly all children were big users of Instant Messaging, all browsed the web for fun, and nearly all played online and CD-ROM games. The specific content of the conversations, websites and games differed somewhat by gender, but even here there was a high degree of overlap. Most Elmhurst children said that they IMed frequently with opposite-sex as well as same-sex friends and acquaintances, and both boys and girls described the same set of conversational topics – school, teachers and classes; news and gossip about friends; and social activities like meeting to go to the movies, or going to an upcoming party. Children's web 'favorites' often reflected gender-based preferences – teen magazines for girls and the World Wrestling Federation for boys – but there was a great deal of overlap here as well: both

boys and girls frequently went to lyrics websites, sites for bands they liked in common, and sites devoted to popular TV shows they all watched like "Buffy the Vampire Slayer." Game-playing was the arena in which gender divisions emerged most clearly. Boys tended to play first-person shooter or FPS games that girls eschewed, and girls often liked to play fashion-related games or fill out online questionnaires on 'relationships,' activities in which boys had no interest. Even in game-playing, however, areas of overlap were clear, and seemed to be growing as children entered more fully into adolescence. As the previous chapter detailed, both boys and girls enjoyed playing games on websites like Newgrounds.com and Bored.com, games which arguably reflect a pan-adolescent sensibility (an attitude, or 'tude' as one boy called it, of generalized mockery and irony) more than a gendered sensibility.

Meanwhile, in Southchester, both girls and boys tended to engage in school-related computing more than recreational computing, and their computing was a similar mix of scribal tasks for school, and game-playing for fun. When it came to game-playing, Southchester boys and girls played a narrower range of games than did Elmhurst children, because they had had their computers for a shorter amount of time, and spent less money on new games. As a result, most Southchester children played the same set of relatively non-gendered games that came with their computer, such as Solitaire, Free-Cell, Mine-Sweeper or Chess, though there was indeed some gender-specific computing here as well. Like the middle class children, Southchester girls enjoyed Barbie CD-ROMS (especially when they were younger) and boys, when they had them, liked to play more aggressively themed shooting games.

Several explanations for the relative parity in boys' and girls' computing arise. The first relates to software developments. Among Elmhurst children, the dominance of Instant Messaging meant that girls were more than equal participants, since a traditionally 'female' emphasis on interpersonal communication is at the core of IMing. At the same time, boys who were interested in realistic, high-intensity action games now turned to relatively new gaming technologies like X-Box and Playstation (which are not computer-based, but run on their own platforms) rather than the CD-ROM-based computer games

that they reported using only a year or two earlier. As a result, during this study boys' uses of the computer for fun looked a lot more like girls' uses than they likely would have before the era of popular game boxes. Another explanation may have to do with the relative gender parity we found in both communities between male and female parents when came to computing knowledge and confidence. In Elmhurst, parents of both sexes were relatively highly skilled, while in Southchester parents of both sexes tended to be quite low-skilled in using computers and the Internet. To be sure, there were families in which male adults had greater technology experience and knowledge compared to their spouses, based on hobby experiences and work experiences. But there were also several families, especially in Elmhurst, where mothers had used computers for years, were daily, knowledgeable users, and took responsibility for the maintenance of the computer, while fathers were relatively more aloof and inexperienced. Barbara Mitchell described her long-standing interest in things technical as a result of a 'scientist-tinkerer father, and grandfather', and she was proud that Rene seemed to be a confident user as well. In Elmhurst at least, girls' relatively confident embrace of varied computing applications may reflect the fact that they are seeing their mothers, as well as their fathers, use technology in myriad everyday ways, with confidence.

Computing and Gendered Household Spaces. This said, we did see struggles for control of computing emerging between parents in some families, usually as part of the politics of domestic space. In two to three families in both Elmhurst and Southchester, computers and the Internet were located in semi-'private' spaces such as dens and home-offices or 'Dad's office', that became retreats for male adults, raising conflicts and inequities of access and use for other family members.

In three Elmhurst families and two Southchester families (25% of the sample overall), tensions existed due to the male parent's tendency to retreat into a computer-equipped den or office for long periods of time. In these families spouses complained that this behavior made their husbands even more aloof than usual from household tasks and roles, and generally unavailable to the children (and implicitly to the wives too). Mrs. Verderame said that "Jerry just disappears up there [in his office] when he has a deadline,

and we don't see him for days." And at a later moment she said with exasperation, "He's in there all hours of the night. He loves rotisserie baseball [an online game]. Plus, who knows what else he's doing." In Southchester, Julia Coleman, who described herself as a 'single mother with a husband' because of her spouse's aloofness from the rest of the family, saw his 'den' as partly to blame. In his den, Mr. Coleman has created as an exclusively 'male' room, full of the latest technology. Julia refers to the room laughingly, but in ways that also suggest her resentment: "That's their father's 'whatever' room. His office, his recreational, love-my-life room. Only he's allowed in there. He's got TV, DVD, digital camera, everything is in there. CD's, computer and Internet. It's just where he and his friends hang, and….where he plays his games (she pauses, and her voice trails off slightly)… and stuff."[7]

In two Southchester families, a 'male domain' of computing had the effect of reducing female children's access to computing. Mr. Coleman's 'den' was the location of the 'good' computer – the one that was new, fast, and connected to the Internet, to a printer, and to a digital camera. But the rest of the family was generally not welcome in the den, except for Derek, his son, who was allowed in on weekends to watch sports on TV with his father, or play video or computer games with his father. Amara, as a girl, had to content herself with using the TAA computer, which was unconnected to the Internet or a printer – a situation which rendered it almost useless for school work or communication.

This situation suggests some of the complexity of 'home access.' Amara and her mother *appear* to live in a household with an abundance of computing resources; however they don't have access to those resources in a meaningful way, because of the father's proprietary attitude toward them. Only Amara's brother is allowed to socialize in the father's 'whatever' room. We could not probe the reasons for his proprietary attitudes. We found in at least one other low-income family, and in two or three middle income homes, that fathers had 'offices' that were understood to be off-limits to children except

[7] A handful of comments like these from female spouses suggest that they believe their husbands are sometimes engaged in online chats or pornography viewing that they seek to keep private. We have no way of knowing what the content of adult computing activities is. But tensions around the 'privacy' of home computing may arise in part because some adults using the medium at home are redefining the traditional boundaries of sexual and affectional freedom and fidelity within marriage.

on rare occasions. The difference is that, in the middle-income homes, other computing resources were available to the children; in the low-income homes they were not. Thus, gender differences in computing access did appear in this study, but leavened by class – that is, only within the lower income families.

In these situations we can see one of the key ways that an Internet-connected computer differs from a television as a home technology – this is in its relation to space and privacy. Television is designed as a shared medium (screens are large and remote controls are provided to enable people to experience it from a distance, across a room) while the Internet-connected computer is designed as a medium for individual users (screen displays and input devices like the mouse are designed for up-close use by a single person). The content created for each medium is likewise differentiated: advertising-supported video programming seeks to engage the greatest numbers of viewers in a room if possible; while much web content, even if ad-supported, is print or in such a small format that only a single user can read and/or see it. Of course, single viewing of television does occur frequently, and co-use of the computer is common as well (though less common it appears to us) but the gravitational pull of each medium in a household is toward shared use in the case of television, and individual use in the case of the computer. It is this feature – as an interface to personal, and often intimate content – which enables the Internet-connected computer to become focal point for household struggles between parents, and parents and children, over the definition of 'personal, private' activity.

7. Wider Community Resources: Physical Safety and Cultural Enrichment

The final factor I will discuss affecting children's computing are the wider resources of communities and neighborhoods. Two types of community resources had important consequences for children's computing: the physical safety of neighborhoods, and institutions such as the public library and the Internet Cafe.

Elmhurst's neighborhoods are physically safe, encouraging parents to let their 11 to 13-year-old children spend time outside, and even walk around town on their own. For

many children (but not all) this meant that time at home with media was balanced to a certain extent with time outside; and time finding information needed for school on the computer was partly balanced by time finding non-computer material in the public library a short walk away.

In contrast, the urban neighborhoods in which our Southchester cohort lived were experienced as unsafe by nearly all parents. Crime and violence are facts of life that urban working class and poor parents cannot not afford to ignore. (Members of two Southchester families, the Munozs and the Castillos, experienced violent personal attacks during the period of the study: Mr. Munoz was stabbed by drug dealers in the lobby of the family's apartment building, and Dina Castillo's older sister was mugged leaving the neighborhood subway station.) Concerns about neighborhood safety meant that most Southchester family members – and especially the pre-adolescent children who we focused on – lived daily lives more restricted to their apartments, to school, with little access to the 'in-between' spaces sometimes enjoyed by suburban children, such as parks, stores, libraries and friends' houses. None of the Southchester children went to the local public library with any regularity, and parents cited safety concerns as chief among the reasons. Southchester parents and children thus saw their home computer as providing a safe way to access information that they could otherwise only get with considerable difficulty and risk. "The computer's good," said Ernesto Miro's father, "because they get everything they need right here, at home. They don't have to go out." Working class parents and children thus used their home computers as a conduit to resources that their suburban counterparts could access physically.

Second, Elmhurst children enjoy access to cultural institutions that directly support their computing and help build computer skills, institutions that do not exist or are inaccessible to Southchester children. The two branches of the Elmhurst Public Library, well-supported by local tax revenues, have rows of computers reserved for use by community members, including children. Librarians are well-trained and carefully monitor children's use and offer assistance in finding online resources, as well as, in the process, homework help. Three of ten Elmhurst children used the library weekly, and four more visited it at

least once a month, for both schoolwork and leisure reading. In addition, Elmhurst's single quaint downtown street has an Internet Café among its shops and restaurants. The back room of the café serves as an informal gathering place for Elmhurst children between 9 and 17 who are interested in computing. An average weekday afternoon found five children playing games and creating banners for a community event, guided by the proprietor's 13 year old son; and on a weekend visit we observed a club consisting of nine teens, mostly boys, playing a highly involved Dungeons and Dragons-style game that they had invented themselves. The Internet Café also sponsors formal clubs and classes for children and adolescents on weekends and in summer. Barbara Mitchell had paid for Rene to attend a series of sessions specifically designed to boost girls' confidence and interest in computing. Barbara was critical of the classes as being too lax, too much about fun – she complained that the courses were not designed to build skills cumulatively, in ways that Rene could continue practicing at home – but Rene seemed to get the point, which was largely about building confidence. "We played all these cool computer games," she said, "and I got to the top level… it was great."

In sum, differences in neighborhood resources – both physical safety, and institutions providing cultural and computing enrichment – helped to shape the kinds of computing that middle and working class/poor children did.

Summary

The social-structural differences outlined in this chapter help to limit and shape the computing middle and working class children do, usually in ways that appear to reinforce existing inequalities. Southchester children's lesser access to 'quality' computing resources described by Becker (2000) – for example, reliable Internet access and a working printer – meant that they were sometimes unable to pursue consequential activities like completing homework and communicating with teachers, and instead made do with playing simple computer games. The computer skills and experiences that Elmhurst parents brought from work, and demonstrated daily in their home offices, enabled them to provide direct help to children and also to model work habits. When computer problems arose, Southchester families could not turn to knowledgeable others

in their social network, the way Elmhurst families did, so they had to make do with non-working computers for far longer. Schools in both communities tended to send home assignments that called mainly for information retrieval and scribal tasks, but higher track Elmhurst teachers, and school librarians in Elmhurst, also asked children to use and evaluate information critically in their schoolwork. Elmhurst's safety and the presence of well-resourced libraries and an Internet Café created a supportive environment in which children's computing could thrive, while Southchester children were thrown back on their relatively scarcer home computing resources.

Yet if most structural circumstances reinforced existing inequalities, others were obliquely related to them, or even ameliorated them. The smaller size of homes in Southchester, and the smaller number of computers in them, meant that computing activities were more often shared in Southchester, that family members tended to help one another more, and that the computer could be mobilized along with resources of ethnicity (for example the singing of Spanish-language song lyrics found online) for positive family experiences in which all took a part. In several immigrant families in Southchester, as we saw in Chapter Three, shared computing meant that siblings, encouraged by parents who themselves had little social capital, used the computer as a conduit to get practical information about scholarships, private schools, transportation and consumer options.

Meanwhile, the greater number of computers in Elmhurst homes, and their dispersal in larger houses, meant that children tended to use the computer alone, for more individualized and private ends, and that conflicts with siblings and parents around computing arose more often. As we saw in Chapter Three, this meant that while some Elmhurst children were using digital technologies in robust ways that involved thinking and creativity, others spent long hours alone at the computer dividing their attention among school work, recreation and communication in ways that may be detrimental to all three. These children are and are interacting online in ways their parents and others are largely unaware of, and would disapprove of if they knew about.

What do these patterns of computing mean for the kinds of computer-related knowledge and skills children are developing and will carry with them in the future? Are children in Elmhurst and Southchester learning distinctive sets of skills or orientations toward digital technologies that might have relevance in future education and work settings? What of the differences in children's computing within each community – are Elmhurst children working on stock-market simulations or building websites about their favorite videogames developing a qualitatively different understanding of information technology than those that spend long hours IMing with friends and strangers? To date few studies have tried to map children's knowledge and understanding of digital technologies across the range of their uses. It is to these questions, and this task, that we turn in Chapter Five.

Chapter Five

Scribes and Surfers: Digital Literacies in Two Communities

How successful are Elmhurst and Southchester children at using the digital medium to accomplish information tasks? What level of computer-related skills, or literacies, are they developing at home? The study examined children's computer skills in several ways. First, in the area of troubleshooting, we listened in interviews to what they told us about technical problems that had occurred with their home computers, and how they and their family members went about dealing with them. Second, we posed questions that might elicit their understanding of the medium's structure. For the Internet, for example, we asked, 'Suppose you were trying to call up your homepage, and the screen said 'Cannot connect to server.' What might be going on? What would you do?" Third, we gave children semi-structured tasks and took notes on what they did. In one task, the 'Desktop Tour,' children gave the researcher a 'tour' of the computer, explaining and demonstrating the major applications on it, and opening and explaining any files they had created, including their Internet 'favorites' file – which contained the websites they most commonly visited. Another task, the 'Web Search,' asked students to show how they go about finding web pages with information on a sample topic we provided – in this case, current threats to endangered whales, and what is being done about them. For the final task, we asked them to look at four web pages on the problem of school violence, decide which one was most useful and reliable in explaining the problem, and tell us why. During all these tasks, we observed how children navigated the medium as they moved among and inside applications, files, and hardware configurations – either fluidly and with confidence, or with frequent road-blocks and uncertainty.

Finally, and just as important, we listened to the way children talked about their use of the computer and Internet. Some children, we found, possessed a language for describing the medium's nature and limitations, and also their ongoing struggle to balance competing school and leisure uses. Others – most -- did not.

This chapter describes the literacy parameters of children's use of the digital medium in Southchester and Elmhurst. A theme that gradually emerges from the data is that, in using technology at home, children are learning and absorbing not just discrete skills but a repertoire of uses that, taken together, comprise an orientation or posture toward digital tools and their use. It may be that, even more than specific skills, this orientation is what will have ongoing consequences for children's ability to apply information skills successfully in institutional settings of school and work.

This chapter describes differences in children's fluencies that we observed in four areas – a) their troubleshooting ability, b) their use of common productivity tools, c) their skills in searching for information on the web, and d) their ability to interpret and evaluate what they find on the Web. The first and second literacy areas – troubleshooting and using productivity tools – comprise basic skills that users need to keep the computer working and to use it for common information tasks. The third and fourth literacy areas – searching the Web and evaluating the information they find there – comprise 'higher order' skills made especially critical by the digital medium. In discussing these elements of technology literacy, I try to describe some of the cognitive and even emotional work that they appear to involve. At the end of the chapter I summarize what I see as contrasting orientations toward digital technology – a 'scribal' orientation and an 'information' orientation.

A. Troubleshooting Literacy in Southchester and Elmhurst

As household products, computers are notoriously fussy, demanding constant problem-solving of their users in order to manage applications and files, get and stay connected to an Internet Service Provider (ISP), and connect successfully with peripherals such as printers, scanners, fax machines and digital cameras.

We observed innumerable instances where children and family members had problems with hardware and software. And over half of families in Southchester, and two families in Elmhurst, had significant interruption of their computer and Internet functioning during the period of the study, for weeks and sometimes months at a time. The following

interaction with Amara Coleman, a Southchester 12 year old, reflects the kinds of routine interruptions in dial-up service that we observed during the study, especially in the Southchester homes (which had, for example, fewer computer-dedicated phone lines than Elmhurst households).

IV: OK, now let's take a tour of your computer. Is it on?
Amara: It was on. I'm trying to connect now, but it won't.
IV: Does this computer normally connect to the Internet?
Amara: Umm…Uh huh. But it doesn't want to now.
IV: How many phone lines do you have?
Amara: One. We take the phone off here, and then… we connect it there. It's the best time to talk on the Internet, if there's been no dial tone.
IV: Sorry – you mean to connect to the Internet you don't want to hear a dial tone?
Amara: Yeah … [sound of modem dialing ISP number, trying to connect to server, and failing.]
IV: Uh-oh, you closed the Internet connection.
Amara: Oops…. I shouldn'a done that. …
IV: Now you're clicking the AOL CD-ROM. How come?
Amara: My uncle put it on. He said we can get on with it. You get free minutes.
[Clicks through several screens and tries to install the software, but the computer hangs.]
IV: What happened?
Amara: I don't know. I don't know what happened here. Maybe I better turn it off. [Turns computer off and on, using the power switch.]

Prior studies suggest that the troubleshooting knowledge available in the family is an important variable in predicting whether and how well the family will be able to use a home computer. In the Homenet study Kiesler and colleagues (1997) found that even with hardware and software designed for ease of use, people found the technology complex and difficult to use. Some of the families stopped using the Internet altogether rather than persist in the face of problems. Researchers found that a family's ability to evolve as Internet users depended on at least one member having a higher level of skill, confidence or enthusiasm and commitment to the technology; this person – often a teen but sometimes a parent – became the 'guru' for the family. Where no one in the family had this kind of knowledge and commitment, Internet use lagged and other family members did not develop much as users.

Other studies (Neuman et al, 1996; Howard, Rainie, and Jones, 2001) confirm that experience and confidence – not just in the household but in the extended family and

among neighbors close by – matters. Katz and Aspden (1997) studied the role of social and work networks in introducing people to the Internet, and found that, especially for recent users, people learned to use the internet first from friends and family, second from learning at work, and third through self-teaching. Help-getting, then, is a 'network phenomenon'. And yet low-income adults and communities lag in technical know-how compared to their middle class peers, whether it is in years of computing experience (Danzinger et al, 1998), use of technology in educational settings (Hargattai, 2002) or the availability of affordable and trustworthy computer retailers in low-income areas (Schon, 1998).

We define as 'troubleshooting literacy', then, the knowledge and skills required to keep a computer working, to overcome the routine stumbling blocks that occur in managing files, printing, connecting to the Internet. It is as much an posture – active, confident, tinkering, willing to proceed by trial and error – as a specific set of knowledge or skills. This is because routine computer problems are 'over-determined': they will certainly occur, but they may do so for any number of reasons. For example, when a user tries to print a document and the printer fails to respond, it may be because a) the printer is out of paper or out of ink, b) the printer cable has become dislodged, or c) the print queue has been stopped, for any of several reasons (a problem with a prior document, unrecognizable characters or fonts, etc.). Fixing the problem requires, first of all, a diagnostic attitude (what's wrong?) and a willingness to look for the most obvious, observable, sources of the problem (check the paper, the ink, the printer cable). If the problem is with the printer software, however -- as it often is -- direct observation is not possible; instead users must rely on special applications such as the 'Print Monitor' – a software program that monitors and reports on printer problems. Such programs, however, have multiple features and options – identifying what documents are in the 'queue', how to pause and resume printing a document or delete a document, and how to start and stop the queue. Few users are ever formally taught to identify and use features like this. Yet solving a common printing problem depends on being able to navigate them: scanning the menu of options, trying first one, then the other, in order to try and get the queue started, and the document you want transferred to the printer. How do

children come to learn troubleshooting habits like this? What kinds of troubleshooting literacy did we find in Southchester and Elmhurst?

Troubleshooting in Southchester

In Southchester, first of all, children had much more need of troubleshooting literacy than children in Elmhurst, for their computers and internet connections, especially, presented many more problems and interruptions. Yet few children among the Southchester families were good troubleshooters – children with the knowledge and confidence to solve problems themselves. Children generally didn't try to solve problems by themselves, but turned to other family members, often older siblings, sometimes parents or extended family living with them. These family members were often unable to solve the problem, however, and the solutions they tried often introduced new problems instead of solving the original one.

> Ernesto Miro (12) has a problem printing one of his social studies reports, while his family looks on. He asks his older brother: "Alberto – do you know what's wrong?" Alberto says "Is the light on? It is, ok, do it again." They watch and see that it still doesn't work. Alberto helps him open the Print Monitor, which shows about ten documents lined up in the print queue, all repeats of the same 3 documents. "Click the first one, then hit print," says Alberto. They spend 5 minutes trying to get the printing going, and finally start printing the first of the ten documents. When they see that this is what happening, Alberto says "Stop, stop! We can't waste all that paper." They stop. "We can't print now" says Alberto. When the researcher asks what they'll do now, Ernesto says, "I'll ask Mr. Feldman [the ASE science teacher] as school. He's helped me before." [Fieldnote]

At this point, the children's and families' options were limited. They generally did not have relatives or neighbors close-by whom they could turn to. Most often they turned to the school computer teacher, who had been a broker in bringing their TAA-donated computer to them. But communicating back and forth at a distance about a computer problem, through a child, proved difficult, and often introduced more confusion.

> Amara, 13: "Our Internet stopped… I asked my computer teacher what to do. He said write down what the message on the computer was, so I did. It said 'Exceeds memory limit.' He told me to call the TAA [help desk] number, and I did. After like two weeks they came and …they said it was not the computer, it was the Internet company. But Mr. Feldman thinks it's the computer and the memory."

Many parents and children hesitated to use the telephone to call the technical help provider at TAA, or their ISP, even when they knew they needed to. Those who finally did often had difficulty communicating clearly with the provider (even when they were able to speak with someone in Spanish), in part because they lacked a language for describing the nature of the problem they were having in much detail. As a result, most described the experience as unsuccessful. The result for both children and their families was frustration and a lack of confidence in their ability to solve technical problems, and in some cases, resentment and suspicion of TAA and the Internet Service Provider.

The following transcript of an interview with Sonya Broyard (13) and her mother, Maurita, indicates the difficulties Southchester families faced in communicating with service providers.

Sonya: The computer works. Just the Internet doesn't work.
IV: Did you call anyone?
Sonya: No. We never called.
Maurita: I told him [Tom, a TAA help desk staff member] that it didn't work. And I told 'em that I have AOL, and they said I wasn't supposed to have that.
IV: How did you tell them?
Maurita: I emailed them. I emailed them from work, the day before yesterday. He told me I couldn't have AOL on the computer. It would wreck the TAA stuff [software].
IV: I think that's because AOL is not compatible with the software TAA has installed.
Maurita: Yeah. He said we couldn't have AOL in this computer because when we did the interview at the school they said that we weren't allowed to have it. But the reason why I did that is for the girls so they can do research on it. And still they can't do it anyway. Because I can't get on the website.
Sonya: It's just the Internet we can't get on. But I can do Internet at school.
Maurita: You should be able to do it here. But they say I'm not allowed to have it. Well I haven't wrote to him yet, Tom. But I will. I'll tell we should have it.

Two of the Southchester families were better able to help their children troubleshoot technical problems. In these families, the fathers provided home technical support to their children. Below is what two mothers have to say about their husbands' experience with and interest in computer technologies.

Luz's mother, Nira: "The children's dad helps the children

> when there is a problem. He used to run a community technology program and my daughter borrowed CD-ROMs from his place. He is a proficient user of the computer and Internet at work."
>
> Alicia's mom, Wilmita:" [My husband] is crazy about computers and electronics in general. [He] is always trying to solve technical problems with his own computer. For him the whole experience with computers is fascinating. He learned it in the Dominican Republic. He built his own computer with old computer parts. He is curious and keeps learning by questioning customers who have computer knowledge and who come to [his] bodega. He also buys books to learn about computers. For example, he got the Apple 1 Graphics because of his limited English. It is easier for him to follow graphic directions than text."

Troubleshooting in Elmhurst

As troubleshooters, Elmhurst children appeared to have several advantages over their Southchester peers. First, they had more personal knowledge to apply to technical problems. Second, they had more knowledgeable others close at hand that they could turn to. As a result, they had more success – and more confidence in themselves as capable of meeting technical problems. Fostering their success were two factors: parents and sometimes aunts or uncles who knew a lot, relatively, about the computer, either because they were 'buffs' or because they brought skills from the workplace; and parents with the confidence to turn to help providers and get help, by dialing help lines. Finally, they had parents who talked with them about problems with the computer, as about much else; in this process, they appeared to learn not just the specifics of computer operation, but also a more general confidence that they could solve problems.

Seven out of the ten middle-income children report that they troubleshoot technical problems themselves. All ten say they get help from knowledgeable family members, friends, and relatives.

When these children troubleshoot problems themselves, they do so mostly by trial-and-error and, more rarely, by consulting manuals or on-screen help. The types of troubleshooting they described doing include: getting peripherals to work when setting up a new computer (using an on-screen manual), overcoming persistent crashes (by

reinstalling a program), recognizing server failures (by interpreting error messages), and finding misplaced files (by searching the computer hard drive).

> Lucy, 12: "My brother and I set up the computer all by ourselves, and when we didn't know how to do something, we went to the HP Tourguide to figure it out."
>
> When Cole, 13, keeps getting "server not found" messages for a chat page he likes (Damaged.net/pwchat), he first retypes the URL twice, then says: "Let me try a different address — htloz.com. It's another way into the damaged.net server." [Fieldnote]

The Elmhurst children's troubleshooting strategies do not always succeed, but they show confidence and resourcefulness nevertheless:

> Mark, 12, says that when he got error messages in trying to play a sound file he had downloaded, he typed them into the search box in the ask.com website. [Fieldnote]

Not all Elmhurst children show this level of personal confidence. Two children, both girls, saw themselves as the cause when something went wrong. One said: "I don't want to [download anything]. I did that before, and I broke the computer." But four of the girls showed confidence in troubleshooting problems themselves.

All ten middle-income children showed a propensity to seek and get help from others — first and foremost, from those closest at hand in the house — when they were not able to fix a problem themselves. Six children turned for help to parents, and three turned to older siblings. (When there were older siblings in the household, they were usually deemed the computer expert.) Two children described getting help from extended family members such as uncles or cousins.

Three children turned to peers for help, usually school friends, especially around the use of Instant Messenger, such as managing Buddy Lists. Two sought help online, from the Microsoft and ask.com websites.

Children in this middle-class suburb do not themselves make use of telephone help lines, though some parents (eight out of eighteen) occasionally do so.

Parents in six of the middle-income families provide troubleshooting help to children. Their ability to do so, and also to get help from others, comes in part from their own substantial experience with technology in their work lives, and in their family backgrounds.

> Tucker, 13: "If I can't figure it out I ask my dad for help. He does a lot of stuff with computers in his job."
>
> Barbara, Rene's mom: "I feel confident in solving pretty much any software problems — like when AOL numbers don't work for access. If I'm stuck I can use onscreen help, or read manuals, or ask Dad, or a friend. … My grandfather was a physicist at Bell Labs, and he's a photo and computer expert — I think my confidence comes from him."

Parents in seven of these families also draw on the technical knowledge of relatives such as uncles and brothers-in-law and even grandmothers, whom they contact by phone, or ask to look at the computer during family visits.

> Patrice, Fiona's mother: "Right now our computer is so full, it crashes a lot. Something about the memory. I'm going to phone my brother-in-law in Florida — he'll walk me through it step by step."
>
> Barbara, Rene's mom: "We have a cousin who's a computer whiz — we call him up and he tells us what to do about hardware problems."

When Carol Fleischer, Mark's mother, was divorced for a time and had no closer recourse, she took her computer into the law office where she works, and had the computer department fix it for her, free of charge. This underscores the role of middle-class workplaces in creating a foundation for families' and children's technological literacy.

In two families, when a computer broke it was left un-repaired, because these families, like more than half of the Elmhurst families, had other computers they could use.

Children's troubleshooting literacy in these households appears to rest on two things. First, children exhibit considerable confidence that technical problems can be solved. Even when their problem-solving strategies do not work at first, these children often persist in believing that they or someone close by can fix the problem, and this

persistence often leads to success. Such confidence appears to be a learned behavior, born of expectations and experiences of efficacy and success that reside in the family as a whole. Sometimes, parents may deem their children's sense of efficacy more important than the computer hardware itself. For example, Cole and Mark, two boys being home-schooled, described how their experiments with the computer often led to crashes, and Karen their mother said: "But I don't mind that, because through the process [of experimenting] they're expanding what they know."

The second major factor in these middle-income children's troubleshooting was the amount and quality of technology expertise that resides close at hand — among parents, older siblings, and extended family members. The adage that successful use of a personal computer depends on "how close you are to a nerd" seems to hold true for these families, who are all only one or two steps removed from someone they characterize as "a computer expert," and who regularly helps them navigate the software and hardware snags that arise persistently for everyone. The availability of such knowledge and expertise in their immediate family and social networks is rooted in social class factors of employment and education; parents and extended family members encounter computers and computer troubleshooting in their work lives, in their schooling, and often in their hobbies. Even when they do not have such experience, high levels of literacy and experiences of efficacy make them relatively comfortable reading manuals, and asking others for help using whatever language they have available. These activities, in turn, model troubleshooting habits and attitudes for their children.

In sum, when it comes to problems with Internet connectivity, it appears that troubleshooting has only partly to do with technical know-how; it also depends greatly on social confidence, in one's belief that one can solve the problem, and in having a language to describe the problem. Because problems often cannot be solved alone, users need to turn knowledgeable others close at hand, or to technical help-providers. With the latter, especially, they need to describe the problem in enough detail so that the providers can diagnose the situation, and then follow and apply instructions about what to do. Among some Southchester families we saw that inability to communicate successfully to

solve a problem and continued failure to understand its nature and sources leads to a weakening of confidence and social trust, as people began to doubt the good will of the agency donating the computer, and the company providing Internet Service.

B. Fluency with Common Productivity Tools:
Procedural vs. Structural Understanding of Digital Technology

A centerpiece of what I will call Southchester children's 'scribal literacy' is their use of word processing software, for schoolwork, and also for personal and family documents. Scribal literacy is characterized by a basic functional familiarity with software features, and a 'cut and paste' approach to the construction of documents, according to generic criteria (eg, a business letter has a salutation, some body text, and a closing, a poem has short lines that can be formatted in different ways on the page, etc.). The digital medium is approached as a tool, but only in the narrowest sense – a tool for executing tasks according to someone else's specifications, not one's own. (A copyist or scribe may copy text accurately, but in doing so the text has little sense of meaning or value for the self.)

All the Southchester children displayed basic functional literacy with the most common productivity tools, including their computer's operating system, a word processor, email and a web-browser. This means they had the ability to execute the core tasks the software is designed to accomplish (saving and finding a file, producing a text document, sending a message, and accessing a web-page with content one wants). For two thirds of the children, this was the extent of their literacy with common tools. A third of the children had what could be called more advanced functional skill with these applications, which means using the software's more advanced features to achieve specialized effects, personalization of documents or messages, or convenience (i.e. time-saving short cuts).

Microsoft Word is the application the working class children in this study use most often. With word-processing, most know how to use common features like Help, save, zoom,

cut and paste, open new file, format documents (e.g., font/size, bold/italic/underline, and page justification), insert picture, and spell check. The children use these functions nearly every day in typing their homework assignments. Amara, for example, is familiar with all of the text formatting features of Word, but like many children, she hasn't yet learned to use these purposefully.

Amara: The first button you do is right here, it opens a blank page. This is to open documents that you've saved. This is to save documents on disk, and this is for printing back in the printer. The heading I don't really use that, but you can change the way the typing looks. This is the font to change what you're typing — the style. This is the size of which you're typing in. This is to make it bolder. Italic is to make it slanted. The U is to underline it. If I go here [she clicks the icon to center the text] it's all in the center. Like it's centralized like a poem. — And that's basically all the buttons.

IV: There are different fonts in your document about Marian Anderson here. You go from curly cue to straight, right? And it gets bigger, and it's purple. Why did you choose different fonts here?

Amara: I just like the way it looks. I always change them, just to see what they look like. But my printer is only in black and white, so you can't see the color.

In contrast, several of the Elmhurst children were able to articulate reasons for using different font formats, as Rene does here:

Rene: I love to use Comic Sans, it just looks so, I don't know, school-ey, and cute. And you can still read it. My science teacher says 'take it easy on my eyes, don't make me use a microscope.' When I do poems, sometimes I change the font so that it looks like the feeling of the word. Here's one. This poem's about a crazy night in the jungle with all these animals dancing, and I use this squiggly font for the world WILD, that looks like branches. And this one for Baboon, sort of looks like it's hanging down, like a baboon.

Typing and learning to type

Southchester children's scribal literacy with common tools derives partly from the Academy for Scholastic Excellence's emphasis on scribal skills. ASE gives students extra points – or 'ganas' – if homework is typed, and typed neatly. ASE also stresses touch-typing as an important skill. It gives all students introductory instruction about the

correct finger positions, some initial practice, and software – a program called Accutype – to practice with on their home computers. Accutype has a series of built-in tutorials through which young typists can gradually master the skills of touch-typing. In contrast, Elmhurst teachers, while they preferred homework be typed, were sometimes reluctant to require it because this might put poorer children without home computers at a disadvantage. Also, they did not stress touch-typing, did not teach children to touch type, and did not send or recommend typing software for use at home. As a result, Elmhurst children were largely self-taught when it came to the keyboard and to typing.

Despite the different emphases schools placed on learning to type, it is children in Southchester who most often describe themselves as struggling with keyboard skills, while Elmhurst children mostly see their typing ability – whether they are good or bad -- as a non-issue. According to our observations, Elmhurst children are more fluent – that is, fast and fluid – typists than most Southchester children. The fluency of their typing appears related to their use of Instant Messaging, a highly informal medium in which speed and brevity, not accuracy and grammatical correctness, are the main criteria. (It is also related, in some cases, to the games of 'office' that some children, like Rene, have played for years.)

We saw little difference in the accuracy of children's typing in the two communities – in both cases, it was quite low: children's routine typing was riddled with spelling and grammatical errors. (For school documents, children in both communities relied on automated spell-checkers to diagnose and correct their errors.) But the confidence of children in their ability to type was markedly different. More children in Southchester describe typing as a barrier in their computing, say they are not good typists, and say their lack of typing ability hinders them in doing certain tasks, like email and Instant Messaging.

> Sonya Broyard, 12: They taught us [at school] where to put our fingers, but I don't do it that good. I keep forgetting where the letters are. This [AccuType software] has four tests, but I only pass the two easy ones. I keep failing these ones. Cause I have to look at the keyboard. I can't look [away] and type, because I mess up.

The Academy for Scholastic Excellence's decision to have children working class children learn touch typing is understandable, for it will eventually help many of them acquire a useful skill (and their efficiency and accuracy may eventually surpass Elmhurst children's). For those Southchester children who have developed fluency in typing, it has already had important practical consequences. Three children do typing that contributes to their own or the household's income, either directly or indirectly. Alicia Munoz types her mother's college homework, and earned $40. in a short period of time typing her mother's friend's homework. Luz Cabrera helps type the translations she does for a local newspaper as a part-time job. And Amara Coleman has typed and proofread her mother's job applications. For most Southchester children however, the short-run consequence of an emphasis on touch typing may be to reduce their confidence in their ability to type and to use the computer for activities such as IMing –precisely the activities by which the Elmhurst children gain confidence as typists and computer users.

> Amara Coleman, 12: I don't do that [Instant Messaging] or Chat rooms cause I don't type good enough for those. Everybody types so fast in them. Plus, there aren't that many kids I know doing them.

Elmhurst children, meanwhile, are becoming fast, though unorthodox two-fingered typists. Through rapid-fire Instant Message exchanges with peers, they gain a fluency with the keyboard that they bring to their school-related typing. The essays and documents they showed us were usually two or more pages in length; while the Southchester children's writing was most often no more than a page. (Though we must be cautious in drawing conclusions about the source of these differences – they may be due to differences in the assignments children get in the two schools, or other factors).

> Mark Fleischer, 12: On IM I'm a terrible typer, I always make tons of mistakes. But no one cares. You just hit Send, and they always know what you're saying. Except, my teacher cares. … On school stuff I fix [mistakes] with spell check.

> Rene Mitchell, 12: I used to make so many mistakes. And be so slow. I'm getting better though. And faster. To practice typing I take the words of a song I know really, really well, like "El Paso". Y'know, "Down in the West Texas Town of El Paso…". And I'll just type them as fast as I can, without stopping. Here's one of those -- see how many mistakes I made?

Elmhurst schools and families appear to regard typing as a relatively minor skill, one that eventually attains adequacy simply through regular use of the computer, with or without formal training. And Elmhurst children appear to share this view. They teach themselves to type, and they type every day without following the 'rules' of typing, or worrying unduly about correct spelling or grammar. They evolve idiosyncratic approaches to the keyboard, approaches that work for them. And they use digital tools like spell-checkers as a 'back-stop' on their typing and spelling ability:

> Tucker, 12: How's my spelling? Baaaaad! But usually I don't worry about it. I just get the words out, fill up the page with what's in my head. Before I print I use Spelling and Grammar and it tells me what the right spelling is. Well not really, you have to pick which one is right. The software is smart - but not that smart.

In approaching typing in this way, Elmhurst children may be absorbing a larger 'meta-lesson': That when it comes to technology, the formal rules simply don't matter that much; what matters is getting the job done. They also seem to be learning that there are multiple ways of getting the job done, and that what counts is finding a way that works for you.

File management: Storing, Organizing and Personalizing Documents

All of the children in both communities have basic file management skills and can, for example, locate files they had stored on the hard drive, open them, and save them as new files. The relationship between documents and the application that created them seems less clear to many, except in the case of Word.

Some, but not all, children also know how to change features of the desktop such as the background, and how to download and install files on the computer. They understand the difference between a file and a folder and the interface/relationship between the file management system in the hard drive and the visual representation of some files on their computer desktop. For example, most of them pointed out during the computer tour session that the file management system allows them to get more detailed information about the documents in the computer.

> Sonya Broyard, 13: "We can see the documents and then we get

> everything more in detail. My dad and science teacher said don't mess with it."
>
> Luz, 12: "They told us in school that the hardware is basically like the computer's brain. Like the hardware is where it does everything. Where it has like all the information. Okay, then on the next icon is my documents and it has like all the documents that I've written. It has all these documents that I've written."

But these basic functional skills with the computer operating system – the ability to move around, save and open files -- do not necessarily translate into information skills. When it comes to the computer operating system, using the digital medium fluently means creating an organizational scheme that works for you – for example, creating and labeling files and folders in such a way that you can fairly quickly find, retrieve, print and use the documents you've made or the information you've culled from the web. In addition, because the kinds of documents one creates change over time, organizational schemes need to be periodically updated and revised.

We found that almost all children in both communities had created at least a single folder for their own work. Usually they labeled it with their own name. (In two of the immigrant Southchester families, however, children created a shared 'sibling folder,' identified by the initials of three siblings, for example. This is likely a reflection of these families' more communal orientation to computing). In addition, three Southchester children, and six Elmhurst children, had created sub-folders and labeled them with different subject areas, such as 'Social Studies', 'Language Arts' and 'Science'.

Only one or two children in each community use their organizational schemes to maintain what could be called neatly organized files. Most children's computers reflected a loose approach to file organization characteristic of much adult computing. Children saved files they created in multiple places on their computer, for example the computer 'Desktop', siblings' or parents' folders, the general 'Documents' folder, or other places. In addition, the names they gave their files were also highly idiosyncratic – things like 'homewk.doc,' or 'Sonya.doc' or 'socialstudys', or 'mrfeldman.doc' – in ways that frequently made finding things difficult.

While few children maintained 'neat' files, Elmhurst children were, on the whole, more likely to create, maintain, and update a file organization that supported their school-related and recreational computing. In part they needed to do this, because school asked more of them. One social studies assignment, for example, required seventh graders to summarize a different current event in the news each week over six weeks, and turn them in at the end of this period. Three children in the study had this assignment, and all of them created an organizational scheme to save and locate the interim files they created, some with greater success than others.

Four Elmhurst children also showed surprising levels of file organization in their leisure computing, reflecting their more intensive and personalized approaches to computing. Tucker Verderame had created files and folders for his BattleBots project that included 'Budget', 'design stuff', 'Parts', and 'emails' (where he and Dean kept copies of important advice and tips from web forum and email exchanges with other robot builders). Rene Mitchell, who liked to write even apart from her school assignments, kept folders for genres such as 'Poems' and 'My stories', and 'Silly stuff'.

The relative absence of organizational systems on Southchester children's computers reflects a scribal vs. information orientation, and the fact that this orientation was partly rooted in schooling circumstances. Southchester children said they frequently did not even save the files they typed, since once they had typed a file and printed it they were done with it. They could turn it in. Teachers rarely required them to do second drafts, or asked them to work on long-term or multi-part assignments for which they would need repeated access to a file. Much of the time, therefore, saving and naming files was incidental for Southchester children.

Elmhurst children, by contrast, were often asked by teachers to draft and revise their written assignments, and also to work on multi-part assignments that needed to be assembled piece by piece over time. This was especially true for children in high track classes. Rene Mitchell's social studies teacher, for example, had her students summarize

a newspaper article a week for six weeks, each on a different topic. Students were to gather the articles, their summaries, and printed bibliographies in a folder and turn it in at the end of the six weeks. So Rene created a sub-folder called 'articles' in her 'social studies' folder, and named her files 'article1', 'Bib1', 'article2', 'bib2', etc. This kind of consistent labeling helped Rene when it came time to gather the materials. When a visitor pointed out that article 4 was missing from the folder, for example, Rene quickly found it where she had mistakenly saved it – in her little sister's folder – because the title 'article 4' was on it.

A final contrast between two children who enjoyed finding lyrics online will illustrate the difference between scribal and informational organization further. Finding lyrics online was a common feature of children's computing in both communities, for adolescents eagerly cultivate their pop music interests, and if there is one role the web fulfills well, it is as a catalogue of contemporary culture. Literally hundreds of lyrics websites exist, cataloguing tens of thousands of songs, though the sites are of varying quality in terms of their accuracy, their layout, and the number of annoying pop-up ads that appear, hampering the user's access to the desired lyric.

When Alicia Munoz, a relatively fluent Southchester web user, wants to find a song lyric she is successful, but only after stumbling about a bit.

> Alicia goes to MSN Search [a general Web search engine] and types the name of the song she wants. She gets lots links – to bands, artists, and unrelated sites and documents. She spends 4-5 minutes wading through these links, then finds one with the lyrics she wants. It turns out to have lots of pop-up frames. She clicks on one that shows a picture of the band that that performs the song. This takes her to a completely different web page, and in trying to get back she accidentally closes the browser window. She opens up a new browser, repeats the search, and goes to the same page. I ask if she just reads the lyrics or prints them. "I print them mostly" she says, and hits print. But a pop-up ad is the foremost browser window, and what prints out is the ad, not the lyrics. Alicia is flustered, and says, "I'd just read [the lyrics] online then." [Fieldnote]

Alicia's habits of Web use lead her to a version of the song she finds difficult to print out and use. Ellen Wagner, in contrast, has bookmarked several lyric sites she likes, and can

say which one is better than the others. For songs she wants to learn, she often copies the text into a Word file, saves and prints it, and keeps it nearby to pull out when the song comes on the radio. Her use of the medium is geared toward maximizing her pleasure in the music she likes, and her participation through singing.

> Ellen, 12: [When I search on the Web] I find lyrics, I find music stuff, I find information on actors and actresses that I like, or TV programs or something. A lot of it's about lyrics, though. I love music, and singing. I just love to sing along to songs. I can't just sit there and wait for the song to play enough to learn all the lyrics. So if I like a song, I have to get the lyrics. I just go to the computer and I print them out. [Int: How? Where do you go?] I have a lot of websites for lyrics in my bookmarks, and if it's not on one it's on one of the others. Lyrics.com is better than going to Google or anything like that. You get right to the song, and not all the other junk, like books or movies with the same words in them. … Sometimes I use lyricland, it let's people change a lyric if they think it's wrong, they add their comments and sometimes they're really funny. … Sometimes the type [the websites] use is too small, or it prints with all weird. [Int: What do you do once you find the lyrics?] Well, I copy them and paste them into Word and save them on my computer, then I just print them out from there. I have this stack in my room where I keep 'em all. And when the song comes on I'll just pull out the lyrics and sing along. Til I learn them all myself.

Procedural vs. Structural Understanding of the Digital Medium

A useful way of characterizing the overarching differences between children's technology literacy in Southchester and Elmhurst is the distinction between 'functional/procedural' and 'structural' understanding of the computer medium. Functional/procedural understanding correctly identifies the specific job that each software program does. For example, here is how Luz, a Southchester child, describes the web filter CyberSitter 2000:

> Luz, 12: "I have Cybersitter. It's sitters, you know, like babysitter. It's sitters your cybering. Cybering's like when you're on the Internet. It is just something that blocks sex images and things that aren't supposed to, you know… It stops little kids from watching things they're not supposed to be watching."

Structural understanding involves awareness that software programs and other computer components are functionally incomplete – that they must interact with one another in

order to accomplish complex tasks. For example, here is the way Carl Logan describes the same software, Cybersitter:

> Carl, 12: My mom put Cybersitter on the computer. It's basically like a filter that keeps you from getting to certain websites…. Basically what happens is the [Cybersitter] company searches for sites that have bad words on them, and puts them on a list. When you type in a website, the program checks the list. If the site you want is on it, you get a red circle and you can't open the site. So sometimes at home I can't get sites my friends tell me about - like killingfields.com. But I can go to school and get them in the lab, where they don't have the filter.

Carl's understanding is 'structural' in that it comprehends CyberSitter software as just one element of a networked system, a system that links his own computer – and potentially any other computer -- to a distant server and a list of prohibited sites maintained by the company that makes CyberSitter.

Overall, Southchester children demonstrated a functional/procedural understanding of the computer operating system and common software tools, while Elmhurst children demonstrated a more structural understanding. Southchester children saw the individual software programs on their computer as each executing a particular job, but they generally could not describe how the programs interacted with one another or with the operating system. When asked how they would fix a problem, they described a series of discrete steps they might take, but they had difficulty explaining why these were the right steps. In short, they lacked a structural understanding of the computer as composed of different specialized pieces interacting with one another to accomplish larger tasks.

Most Southchester children displayed functional/procedural understanding of the Web, too.

> Luis, 12: "I know that I am connected to the Internet when those two little computer shapes right here [on the bottom right corner of the desktop] start to blink."
>
> Delia Castillo: [What's wrong] if the Internet doesn't come up? The thing - Netscape or whatever - doesn't work. You have to turn [the computer] off and on again. Sometimes that helps.

While Elmhurst children were more likely to explain the web in ways that showed a more structural grasp of the medium.

> Julie Christian: [When you can't get to your homepage] I think it means that the server is down or something. It's like the phone lines going down. You can't get through.
>
> Dawn Gillette: Last year AOL used to be real slow - they kept bumping you off, or you couldn't even get on. They didn't have enough servers, especially out here in the East Coast. Then they added more. It's a little better now - but it's way better in the morning.

Sometimes, Elmhurst children's structural understanding of the web also comprehended its institutional character:

> Cole Griffin: All the gaming companies, they like to have fans start their own sites, cause it helps their business. But they won't run them on their own servers. They won't even link to them, mostly. But if you get lots of hits - like thousands every week - and your site looks pretty good, they might link to it. And of course, you provide a link back to their site. So it helps them.

Meanwhile, some Southchester children did understand the Internet from a more structural standpoint. The comment below indicates Juan's grasp of a network as something that must manage 'traffic flow' and that therefore gets more and less sluggish at different times of the day:

> Juan, 12: "My Internet is working. It's just that sometimes at a certain point of the day there's like a lot of people on the Internet and then all the lines are busy. Usually it happens on the weekends because people are not at work. Like on the week, usually like when I get home around 6-6:30 and I get on the Internet before 8:00 it's great till like 9:00. If I log onto the Internet like after 9:00 it starts getting busy."

Structural understanding is important for practical, as well as more long-term reasons. On a practical level, it is difficult to diagnose and respond to the innumerable technical breakdowns that occur in home computing if one does not have something approaching a structural grasp of the medium. Users with a functional /procedural understanding can be rendered helpless by relatively simple problems, as we have seen – (as Ernesto and his brother were stymied by their printer problem.)

On a longer term level, structural understanding of the computer and its sub-components may be the first instance of an individual's grasp of an information system –a central element of so many contemporary bureaucratic, scientific, and business institutions. Indeed, some children in Elmhurst made casual connections between their everyday computing tasks and the world of work that they would one day inhabit. Ellen Wagner wrote in an email of her Web-based stock project "I know that stocks could be a major part of my life later, and it was helpful to learn about how they work and make us money." Tucker Verderame said that knowing the Computer-Aided Design (CAD) software he'd learned on his robot project would be of value first in advanced high school classes, and then probably in the workplace, "if I end up as an engineer." And after Rene Mitchell explained what a spreadsheet was, she identified it as something her father used regularly, and that she would likely use at work when she was older.

> Barbara [Rene Mitchell's mother]: Before we had Excel we had ClarisWorks on there, but I didn't know it. Rene found it one day. She had to do a spreadsheet for an immigration project. In social studies, right? I didn't know how to use it at all. She figured it out.
>
> Rene: Well dad helped me.
>
> IV: Can you tell me what a spreadsheet is, what it does?
>
> Rene: Well it's like a bunch of shortcuts. If you have columns of numbers, you tell the computer to do things with them, like sums, or averages, or subtraction. And it lets you change things, so you don't have to type everything over again.
>
> IV: What did it help you do this time?
>
> Rene: We had to figure out what the first three years in New York would be like, like if we were immigrants. Some people were Italians, or Jews, or German, or Irish. And we had different jobs, different money. So you had to kind of do a budget, with food, with rent, with transportation, entertainment, things like that. We put in prices from this sheet she gave us. You had to choose what you'd eat and where you'd live. Where you'd shop. Do you go to Coney Island or to the opera. Stuff like that. I was Italian, with dress maker for my job. I went WAY over my budget. So I had to go back and change things.
>
> IV: You say your Dad helped you?
>
> Rene: He showed me how to do the columns. The little math symbols, expressions. They showed us at school, but I didn't

> get it really. He uses spreadsheets at work a lot, but not ClarisWorks, something different. But I think they're all pretty much the same. Every job you do you need to figure out what things will cost. So I'll use one too for that.

It is not clear how individuals move from a procedural to a more structural understanding of the computer; whether structural understanding simply emerges from continued, long-term use, or whether in fact it needs to be taught, through modeling and talk, or through more explicit instruction. But as the examples above suggest, there is evidence that at least for high-track Elmhurst children, structural understanding was aided by two things: First, parents' computer knowledge, and their occasional direct teaching and demonstration with children, and also their frequent talk with children about computing; Second, by school assignments that called for more extended, involved and demanding uses of the computer for information tasks like those above.

C. Web literacy – Dealing with the chaos of online content

As content, the World Wide Web promiscuously mixes material from innumerable sources. Simplifying, it may be seen as three distinct though overlapping Webs – the commercial web, the civic web and the informal or 'hobbyist' web. The first two are partly, but not perfectly, demarcated by the familiar URL domain designations. The commercial web is comprised of dot-com sites maintained by corporate and commercial entities devoted to profit-making, usually through advertising and promotion and often through the direct selling of goods and services. The 'civic' web is comprised of dot-org, dot-edu, and dot-gov sites. These are maintained by cultural, educational, and not-for-profit organizations whose mission it is to promote the collective welfare of an informed civil society. The informal, hobbyist web is comprised of all the webpages built and maintained by average web users, from bulletin boards to personal web profiles, to family photo pages to, now, blogs.

As experience with the Web readily demonstrates, the separation between these different types of web pages can be hard to discern. To begin with, the underlying purposes of dot-com and dot-otherwise websites are often not apparent on the surface. Corporate-sponsored sites provide lots of informational material, usually free of charge. And not-for-profit organizations like museums and universities strenuously promote themselves as 'brands.' For example, Weather.com provides free information that many people routinely use to check the weather anywhere in the country; visitors may scarcely be aware that it is sponsored by the for-profit Weather Channel and the American Express company – nor that the 'sponsored links' on the page are generate revenue for weather-related advertisers when users click them. And at the same time, a site like moma.org, the Museum of Modern Art's website, features, in addition to online galleries of artworks, prominent links to the museum's online store, a mainstay of the institution.

Children, like many adults, typically know little about these basic structural components of the web. Often they see web-based information as neutral, more or less reliable, and agenda-free. There are obvious problems with this. First, commercially-oriented websites (dot-coms) comprise much of the Web that children use (Lenhart, Madden & Hitlin, 2005; Lenhart et al, 2001). These sites are often linked to advertised products and media that children and teens find highly appealing. From Nickelodeon.com to MTV.com, to Z100.com (a popular NY-area radio station) to Teenglamour.com, these are websites that typically ask users to identify with a brand, for example by subscribing to a mailing list, or printing out logo-covered artwork, or becoming a member. Increasingly visual, they are characterized by pop-up ads, high-quality audio, interactive graphics, and high production values that their sponsors hope will help them "break through the clutter" of the web and connect with the child or adolescent user.

Second, content that comes from governmental, non-profit and educational organizations is often challenging for children to read and make sense of. Largely textual, it may be written for a general audience, but it is rarely written for young readers, and it is often quite dense and specialized.

Finally, the third kind of content -- the informal, self-published web content -- abounds on the web. This is information created and maintained by hobbyists, buffs, and boosters of everything from Civil War reenactment to gardening, genealogy and holocaust denial. The webpages comprising this part of the web are highly variable in terms of the motivation of the authors and the quality of the results. As with many pages in the commercial web, pages in the informal, hobbyist web often contain few cues about who made them, the people and agendas behind them, and few citations of sources for information provided on them.

The literacies needed to deal with these kinds of content differ. The commercial web often places relatively low print literacy demands on users, compared to the text-heavy informational web. On the other hand, the multimedia nature of much commercial content (now frequently characterized by animation, audio, video, etc.), often requires users to install and update new software in order to play it, which in turn means that users must have basic operating system and file management skills.

The most important fact about the Web, from a content literacy point of view, is that information from all three sources– commercial enterprises, non-profit institutions, and individual citizens and groups – lives side by side on the web, separated by a click or two. Search engines do not automatically distinguish between them. The promiscuity of all this information on the web therefore puts a premium on the user's abilities to search, navigate, judge and evaluate information. Another important habit is to know and use reliable filters or 'portals' that help organize content for relevance and easier accessibility. Finally, most helpful here is a larger understanding of the Web as a 'sponsored medium' – one in which content is created and maintained by someone – usually an institution – for some purpose. Studies have found that more advanced users of the Web see it not as a vast collection of pages of information, like a library; but rather, more like a web of organizations – institutions with interests (both commercial and non-commercial) in having certain of their material accessible to the public.

I am leaving aside, for the most part, speculations about what many consider to be a distinctive form of literacy that the web engenders – a non-linear, associative form of thinking that isolates items of knowledge from their immediate contexts, and moves quickly and easily from one frame of reference to another. This behavior and style of thinking is viewed either positively or negatively, depending on the commentator. Some see this style of thinking as evidence that children and adults are developing skills to cope with an ever more pluralistic and interdependent economic and social world (examples here include John Seely Brown, Sherry Turkle, and Nicholas Negroponte). Others see it as the reflection of a peripatetic consumer society (an example here would be Todd Gitlin), the unfortunate result of electronic over-stimulation on children's brains (for example, Jane Healy), or the failure of the print-based habits of mind on which a rational, democratic culture depends (an example might be Neil Postman). I did in fact see some evidence of non-linear, associative thinking and habits in the children I observed, mostly among Elmhurst children. In my analysis, however, I prefer to sidestep these large (and unverifiable) generalizations that these writers stake out, and focus instead on a much narrower issue: Whether and how children are making sense of the individual web pages that they visit in typical personal and information-oriented tasks.

In this context then, web literacy refers to information skills of the following kinds. First, it refers to children's ability to read and understand web content they encounter in routine tasks. The Internet is still largely a print medium, so this includes mastering standard English, and sometimes the specialized vocabularies and codes that different 'user communities' create. Second, it entails the ability to find relevant information in the chaotic information of the web, using search engines, browsing indexes, etc. As we shall see -- and as Attewell (2003) found -- this in turn entails a degree of cultural literacy, sufficient to interpret the results of a search with some degree of accuracy. Third, it means the ability to interpret and evaluate the information one finds, including considering sources and bias. Fourth, it increasingly means an ability to represent one's views and voice within a medium that encourages the active participation of users. Finally, in a nod to the speculation about 'new habits of mind' on the web, we can say that, at a minimum, the high number of distractions on the web (each page, unlike in

print, offers a multitude of opportunities for clicking and linking out to other content) requires users to exercise certain attentional skills – related to the multi-purpose, multi-tasking nature of the medium.

What did we find in Southchester and Elmhurst children's web literacies? As we noted in Chapter Four, overall, Southchester children make less use of the web than their Elmhurst peers; still, about half the Southchester kids surf the web regularly. While they read well on the Web, when it comes to searching the Web the Southchester kids use a few favored sites or strategies, and rarely revise them. Their ability to interpret search results is sometimes hampered by their relatively limited cultural literacy. Their skill at interpreting and evaluating web information varies, but overall is less developed than the Elmhurst children's. Southchester children appear to be influenced by the cut and paste orientation of many of their school assignments from the Academy for Scholastic Excellence, which ask for little critical judgment about information. Children define valuable information as information that comes from recognized providers (often well-known media outlets) and also comes in graphically appealing formats. These children have few or no web authoring skills as of yet. While many of these children can perform web tasks adequately (e.g., copying, saving and pasting web images or text into their school documents), they generally have very little vocabulary for talking more broadly about the medium and it's strengths and weaknesses.

As we also saw in Chapter Three, most Elmhurst children surf the web widely, moving across the Web's varied contents fluidly, as Ellen Wagner's bookmarks indicated. Many use the web in ways similar to their Southchester peers, for recreational browsing through youth-related websites that reflect their preoccupations with shaping an identity in a mass-mediated culture – popular music, clothing and video-gaming, movies and TV shows and youth magazines, are all central for them. In using the web for school-related, information tasks, roughly half of Elmhurst children emulate the Southchester children in that they use search strategies that work 'well enough', and that they do not vary; however half display more sophisticated search skills, and can also interpret and evaluate websites more deeply than their peers. As we have seen, a handful of Elmhurst children

use the web purposefully to pursue hobbies and interests in depth, and in doing so they function as 'authors' in the web medium, not simply readers or consumers. Finally, several of these children possess a vocabulary for talking about the digital medium in its various guises, and critically evaluating the strengths and weaknesses of the web in comparison to other media of communication and information-gathering.

The following sections describe three aspects of web literacy that we observed: a) reading and typing in the web medium; b) searching the web; c) interpreting and evaluating web content.

a. Reading and typing in the Web medium

At the level of decoding, children in these Southchester and Elmhurst families were fairly fluent readers, including readers in the web medium. When asked to read sample paragraphs aloud from web pages with text of varying difficulty, few had trouble understanding even the more challenging passages, and aside from occasional mistakes of pronunciation, nearly all read confidently.

Much reading on the web is actually 'scanning' however – quickly glancing at beginning or concluding sentences and finding cues and clues to the meaning of text from headings, captions and titles (Brown, 2003; Leu et al, 2004). It appears likely that these rapid sense-making skills develop over time as children use the Web: the more robust users in both Southchester and Elmhurst cohorts were better at quickly scanning and accurately summarizing web content than were the relatively more limited web users in each community. In order to perform the web evaluation task we gave them (a task that involved deciding which of four webpages about school violence had the most useful information), students first had to read enough of the webpages involved to make a judgment about their content. No child read everything on the web pages, though. Less experienced web users scanned the pictures first. When they focused on the text, they tended to ignore headings and sub-headings and instead concentrated on reading the 'body' text paragraphs in slow, determined fashion. Because the text levels were varied, these children often got bogged down on difficult words; they also had trouble correctly

summarizing the main idea or information the webpages contained. By contrast, more experienced web users like Ellen Wagner (in Elmhurst) and Alicia Munoz (in Southchester) scanned the entire webpage, sometimes scrolling down and up, before looking at the main body text. These readers noted the length of each piece, and looked for short-cuts that could help them decide what the page was about – they read headings and subtitles and bolded words first, and skipped their eyes over the main body text, reading just long enough to form an opinion about the contents. Despite the fact they read less of the pages' content, and did so more quickly, they often were able to summarize the content more accurately than their peers.

Typing ability also varied in the two communities (as has been remarked above), and Southchester children's lower typing ability served as a barrier to their use of the web, we found. While everyone can use the web by clicking and browsing, common Web conventions like urls pose challenges for relatively novice keyboarders. In this exchange, for example, Amara Coleman trying to enter a relatively simple URL, 'http://www.nick.com,' that her friend Carlita has written down on a piece of paper.

Carlita: O.K. Now type here, you got to put the thing up here [she points to the address box; and Amara moves her cursor up].
Amara: You can type up here?
Carlita: Yeah, you're going to type, this first, http –
Amara: Wait, wait, http….[searches for letters, and types]
Carlita: Yeah, then two dots. … [Amara types two periods.] No not like that, the other thing. You have to take those out. Here, here, here, put the thing [cursor] there, and then just delete those. Backspace. Go right up to the p.
Amara: Two dots?
Carlita: Yeah the …. Right here. [Points to a key.] The colon. [Amara OK. Then put two lines. Here. [Types in forward slashes]. No, they go the other way. Do these. Then W-W-W.
Amara: I know, W-W-W. Then dot. Period.
Carlita: OK. Then Nick. N-I-C-K. Then dot-com.
Amara: Wait, I gotta put a capital on Nick. [Goes back, and deletes all she's typed]. Oh!
Carlita: Mine isn't capitalized. [When she sees the typing is gone:] It's ok, we'll start over. Let me do it.

b. Searching Skills on the Web

In order to examine children's Web search skills we gave them sample searches to pursue, or asked them to reconstruct searches that they had done as part of school assignments, for practical family information, or for personal interests. We noted what kind of search mechanisms they used (typing urls directly, using general search engines like Google or AskJeeves, or going to specific organizations and searching within them); the kinds of search terms they entered; how they scanned and responded to search results; whether they revised and refined their search; and how they decided whether a search was adequate.

Children's web search skills varied widely. Most children in both communities had a functional/procedural grasp of searching: they had one or two strategies that they followed to find to things on the Web. These worked 'well enough' for them, and they rarely varied them. Often these skills led children to websites from commercial sponsors with products to sell, rather than to institutions whose primary mission was providing information. In most of these cases children were not particularly concerned about this, nor did they notice. Ernesto Miro in Southchester and Lucy Smithson in Elmhurst are good examples of children with these functional but limited search skills.

> Ernesto Miro, 12: We answer questions on the computer [for homework]…. Like 'Who is La Reina de Salsa?' My dad said it was Celia Cruz. So I went to AskJeeves and put in Celia Cruz.
>
> IV: Can you show me what you did?
>
> Ernesto: OK. [He types askjeves.com into address bar; then types 'celia cruz' into the AskJeeves search box.] There's different things - biographia, that's biography. [He clicks a link titled 'Biographia De Celia Cruz.' He does not notice that it is listed under 'Sponsored Web Results' and that the url is www.monstermarketplace.com, a commercial vendor. The link takes him to a 'Huge selection of celia cruz' - biographical books, wallets, handbags, and CDs.] I think I did another link before.

If Ernesto does not always distinguish between commercial and non-commercial sites in his list of search results, Lucy Smithson, a Elmhurst 12-year-old, conflates the commercial and informational webs even more, in her searching:

> Lucy Smithson, 12: I got this from my dad – you just add '.com' to the end of the topic. Like, we had to do research on Russia, and uh, Catherine the Great. So I punched in russia.com, like this.

Lucy goes to directly to the address bar and types in 'russia.com.' Up comes a travel services webpage called 'Russia.com – Your window on Russia.' A plain blue page presents text links to 'Vacations in Russia,' 'Hotels in Russia,' 'Entertainment,' and 'Cars.' Rather than see these and conclude that she has reached a commercial tourism site unlikely to have historical information on Catherine the Great, Lucy ignores the links and focuses on a search box that appears in the middle of the page, in order to continue her search. She types 'Catherine the Great' into the search box. The results are three links to merchandise sites with Catherine-related material, including amazon.com and overstock.com. However, an introductory text disguises this. It inserts Lucy's search term into the generic promise: "Here you will find many topics such as Catherine The Great, and additional tools to bring you to what you are looking for." Lucy takes the bait and clicks on the Amazon.com link, titled 'Buy Catherine the Great Books At Amazon and Save!'

> Lucy clicks the Amazon link. A pop-up window appears, with balloons, animation and message proclaiming 'Congratulations! You have won!' and the figure '$5,000.' Lucy clicks it, saying "Oh, let's see if we've really won." She seems to know it's a lure, but she takes a detour anyway. "Sometimes they give you little prizes, not the big money…" After several clicks through separate sweepstakes pages, she concludes, "Oh no, not this time. We'll go back." She has lost her first search window, though, and must start over again. [Fieldnote]

After several more minutes, Lucy finally arrives at an editorial review of a biography of Catherine, that has some biographical information. "This is what I used," she says.

As these examples suggest, common practices in the commercial web – inserting a user's search term into the titles of commercial links, redirecting users to vendor sites rather than informational sites – make navigating and searching the web more than a matter of reading and decoding text. In order to search effectively, users need to have a structural and institutional understanding of the web, as a medium 'sponsored' and maintained by people and organizations with different purposes and agendas. And another common

practice – using highly colorful animated 'pop-ups' with various appeals and promises to get users to click and visit an advertisement-based site – creates constant distractions for all users, but especially young ones.

If most children in the study had these relatively rudimentary searching skills, nearly half of the Elmhurst children displayed more advanced web searching skills: Ellen Wagner, Tucker Verderame, Rene Mitchell and Cole Griffin. These children had a range of strategies for finding information on the web. They might use a major search engine like Google, but they would also look for information they needed in institutional websites like loc.gov (the Library of Congress), or look up a word using Merriam Webster's online dictionary. They varied their strategies based partly on the kind of information they were looking for. For example, they would choose a site devoted to lyrics when looking for lyrics, and when looking for help with a homework problem, they might choose to search in AOL's Homework Help subsection. Crucially, they also repeated and refined searches rather than relying on their first set of results. The way they talk about searching suggests that the web is both a more differentiated medium for them than for their peers (they see it as content created by people, and by institutions, for different purposes) and that searching is partly a matter of guessing at the categories of thinking in the minds of the creators. Here again, we see the emergence of a more structural, systemic understanding of digital media and how to use them.

As a skilled middle-class computer user, Ellen Wagner's web search habits amply demonstrate these more advanced skills.

IV: Can you give me an example of a piece of research you did on the Web?

Ellen: I did a project on Venezuela for the past month actually. It was a big, big project on and we divided the parts between the people in our groups …. I had to do an advertisement saying come to Venezuela, you know, so people would know what attractions the country had. For tourism. I couldn't find anything in the library because everyone else had been doing Venezuela, like a lot of other people, and so all the books were checked out. So I go onto Google.com and I said, send me to Venezuela traditions or culture and it just sent me to a lot of websites so I could do this really good project.

IV: Why don't you take me through some of the steps you took to get you to the sites you found useful. Let's try to find those sites now.

Ellen: OK. Britanica.com gives you information on almost anything. You just type in the search and it will send you there in its own little website. [She demonstrates.] If you type in Venezuela, like this, you get …. lists of articles that are all about the country, like geography, and politics, and history. It says tourism… but there's not that much about what people really like to do – it's about the industry. Good for a report, but not for my ad. … So then I went to Askjeeves.com. [Here] you ask it in the form of a question and it will give you an answer right there. I would say, like [she types] "Where can I find recipes for Venezuelan food?" or something like that, and then [hits Enter] and comes up with stuff that relates to food – like these, these are recipes.

This excerpt suggests that Ellen has learned two things about Web searching. First, effective searching takes place not just via search engines like Google and AskJeeves (which search and filter the entire web) but also within specific organizational sites like Britanica.com that have an identifiable mission and more limited, identifiable, and 'authorized' content. (Britanica's 'little website', as Ellen calls it, is one in which one is essentially searching a set of encyclopedia articles.) Second, she has learned that multiple, revised searches are important – one can fail to find the kind of information one wants in one place, and try another 'door' into the web.

The next excerpt underscores Ellen's grasp of the recursive, categorical thinking involved in effective Web searching. She is keenly aware that revising and narrowing searches takes mental effort, that it involves thinking about language and categories of information. It is, she says, 'like a riddle,' and one in which the computer 'doesn't do it all for you – you have to pull your own weight.'

Ellen: Sometimes [web searching] is frustrating. It's like, it just won't go where I want it to. Like if I want a website on tips for dancing or something, it will have like too many different types of dancing websites, or it just won't go there, so then I have to rephrase the question again. But if I rephrase it like two or three times, I usually get to where I want to go so it is not that hard.

IV: Did someone teach this to you?

Ellen: No, I pretty much just learned it. One day with AskJeeves I went back and just retyped the search but using different words, like rephrasing it, and then it sent me to a whole different website. So then I just did that with everything. It's like a riddle that you are trying to figure out. You have to rephrase it so that maybe it will fit. I mean that, like, as a metaphor…. You have to think about it. … If it doesn't work the first time, you have to rephrase the question and you have to actually think about what you are typing in so that you get the stuff that you want. It's like you do your share of the work by thinking of how to get there, and it does the rest for you by bringing it to you. The computer isn't something that, 'Oh, you just type it in and you don't have to do any work, it just does it all for you.' Because you're actually pulling your own weight.

IV: Can you show me what this looks like?

Ellen: Ok, with Venezuela. If you type in the word Venezuela into Google [does it] it is not going to do you much good. Look at all the stuff you get. That's because it's too general. You have to be more specific. What about Venezuela do you really want? Like I had to make an advertisement for the country, so I wanted to find out about the tourism in Venezuela. So I would type in 'tourism of Venezuela' [does it]. That's better – it's taking me to tourist sites. But lots of them are travel agencies. If I want to know what there is to do, I better try again.

IV: How do you know they're travel agencies? And why aren't travel agencies good sources of information for you?

Ellen: Well you know because you see things like 'Bargain Airfare' and 'Vacation Package', and this one says 'Aruba' which is this island down there where tourists go. And there's these links to things like libertytravel.com –they're a big travel agency. They're mostly selling hotels and airplane flights and stuff, they're not telling you about the country so much. So I could say 'fun things to do in Venezuela' [types it]. This gets me better info I can use. Because I wanted to show that there are fun things to do when you come to Venezuela. You know, that's what advertising does.

Ellen displays several key web-searching skills here. First, she skims a page of search results in order to make a judgment about the adequacy of the search term she has used. Significantly, she does this without clicking on the sites; instead she quickly scans and interprets the highly condensed summary information for the links – the titles, urls, and the brief content excerpts that the search results provide. (We noticed that more novice

searchers, when faced with a similarly mixed set of links, invariably clicked on each of the top links in turn, wasting a great deal of time on fruitless browsing). Second, as criteria for deciding whether a particular link will take her somewhere useful, she deploys a structural and institutional knowledge of the web. She knows, for example, that 'libertytravel.com' is a commercial travel agency, that their interest is in selling vacation packages, and that they're likely to stress airline and hotel information rather than the more general cultural information she needs. Finally, it is worth remarking that Ellen's effective web searching relies on a fairly extensive familiarity with larger cultural and linguistic frames of reference – she knows that 'Aruba' is an island where tourists go, that 'bargain airfare' connotes an effort to sell something, and that the vernacular phrase 'fun things to do' will be an effective filter where more general terms were not. She is, in other words, culturally literate as well as web literate. As we will see below, children who lack this level of cultural literacy are hampered in their use of the web.

The three Elmhurst children who displayed something akin to Ellen's level of sophistication and knowledge in searching the web – Tucker Verderame, Rene Mitchell and Cole Griffin – shared other characteristics with her. All were 'creative recreational' users, (as described in Chapter Four); all but Rene were relatively heavy users (approaching two hours a day on average); and all were in the highest academic track at the local middle school. In addition, and as we will see in more detail in the next chapter, all had parents who actively cultivated their skills and talents through intensive parenting, and who incidentally brought significant computer knowledge to this task.

d. Evaluating Web Information

Most children, whether in Elmhurst or in Southchester, showed relatively similar skills in interpreting and evaluating the information they found on the web. Like Julie Christian, a 12-year-old African American girl in Elmhurst, their main criteria in judging web information was whether it contained 'facts' or 'opinions'. They did not, on their own, note the source of the information and the possible bias or perspective that an author's or organization's motives or agendas might introduce.

IV: When [you're searching and] you get to a website, what do you do?
Julie: I read the first few paragraphs, and if it has any good information then I'll print it out and read it at home. If it's long, and the first paragraph doesn't have what I want, I'll read through it fast, and go to the next thing. …
IV: What's 'good information' for you? How do you decide whether something's worth printing out?
Julie: I would say if it has a lot of facts instead of opinions. And see if it has a lot of stuff on the topic I'm looking for.

In the web evaluation task we asked all the children to look at four websites and decide which, if any, had the most useful information for answering the question 'what causes school violence?' We noticed that most children in judging the four websites were heavily influenced by the format of the webpage they were looking at, its use of graphics, photographs, sound and color, in addition to text. The source or author of the website only entered into their evaluation when it was a prominent and well-known source, like a major news organization such as CNN. When information on the source of the website was not prominent, children generally did not note it.

Of the four webpages on which they might find information on the causes of school violence, children most frequently said that the CNN news webpage would be the most useful. It was the most graphically intensive – a clickable US map offered dramatic photos and text from school shootings around the country over three years, and first person testimony – but provided little analysis of the problem. Here are some of the reasons they gave for saying it was the most useful:

Luz Cabrera, 12: [CNN has] interesting topics. I've heard about these things in magazines and on TV. Plus I like a page if it's colorful. CNN is the best - it shows kids and things kids can relate to.

Alicia Munoz, 12: The I would trust more is the CNN - the one about Columbine. Because it is a news channel they would not put something that's not good on the web. Plus it gives examples of kids' point of view.

When the source of the webpage was not as prominent as the CNN logo, children often had trouble finding it, and this sometimes led them to ignore the intent and possible bias

of a site's creator. Amara Coleman, for example, said the site 'End School Violence Now' was most useful. She noticed that the cause it gave was 'accumulated stress' – "maybe from picking on people," she said – but she did not notice the solution offered (meditation) nor that the site was created by a Transcendental Meditation group as a means of outreach.

Ability to assess strengths and weaknesses of the web as a medium.

In comparison to Southchester children, children in Elmhurst were more likely to assess the strengths and weaknesses of the web as a medium. Rene Mitchell, for example, said that she and her mother had talked about "…how the web has lots of really dumb stuff on it. You can find really good information, like for science, but then there's sites that are all gossip… just about famous people… Or sites like funnyjunk.com. It's basically for wasting time – which I love to do. Mom doesn't get it, but stupid stuff is necessary sometimes."

In terms of strengths, Cole Griffin, 12, compares the web to the local library, and decides that while the web has replaced the library as a source of non-fiction for research, he still uses the local library as a place for fiction.

Cole: I use the Library for research less than I used to. But…it's not like I download [fiction] books off the Internet or anything like that. Some of my friends do that. For me, I'll just go and check out books that I want to read for fun. But I use the Internet for more research than the library.

IV: Do you think there are any differences between the information you find on the Internet and the information you would find if you went to the library?

Cole: No. I don't think so. I think it is just easier to find it on the Internet because it is just quicker. It is right there. Well there's one difference -- books can be written in 1982 and they'll still be there in the library, but [the Web] is updated like every, say, month so you can always get more current stuff. Like if you are looking for current events, you could look in the newspaper, but you could also go online and just go to a news website or something, or the NewYorkTimes.com. And they wouldn't have any books on that in the library, you know.

Cole is clear, in this quote, about a distinguishing feature of the Web, as opposed to many library resources – its currency; the frequency with which many sites are updated.

Making Sense of Literacy Differences: Scribal Skills vs. Information Skills

What larger sense can we make of the differences we observed in Southchester and Elmhurst children's digital skills? As we have seen, the Southchester children demonstrated relatively discrete, 'scribal skills' in using digital technology as an information medium. This skill-set was comprised of three things: a predominance of routine word processing skills (among the common productivity tools they used); a find-and-copy approach to the Web and to Web information; and a procedural, rather than a structural understanding of the way the digital medium works. Many Southchester children displayed fluency and ease with the computer, and with individual software applications they had mastered. But they do not yet show with any consistency the information-related habits and skills that many Elmhurst children are beginning to display.

Elmhurst children, in contrast, demonstrated a set of interrelated information skills in their use of the computer. They apply these skills both within specific applications and across them. These skills include a) organizational skills of storing and managing files; b) customizing software to achieve personalization and greater efficiency; c) refining and adjusting search strategies to improve results; d) monitoring and checking meaning in online communications; and e) questioning the sources of information. They were aided in these skills by a more structural understanding of the digital medium than that displayed by their Southchester peers, which was a more procedural understanding. Finally, some Elmhurst children displayed a penchant for self-monitoring – keeping track of and thinking about their use of the digital medium, so that they could avoid the dangers of multi-tasking, such as losing track of time and not getting their homework done.

Some of the information habits that Elmhurst children display are things that the computer makes easy and efficient, but that many users–adults as well as children–do not take the time or effort to develop. Files and file folders, for example, are design metaphors common to most contemporary software and operating systems, and using them makes it far easier to organize and retrieve documents one has created. Personalization tools (e.g., Internet 'bookmarks' or 'favorites', or the 'preferences' file in many applications) enable users to put their 'stamp' on the documents and messages they create, or streamline activities they do often for efficiency. Search engines are designed to respond to small changes in the search terms used, but many users spend minutes or hours browsing helplessly through links that are remotely related to what they want, rather than revise a search. The more fluent Elmhurst children are learning to use these tools flexibly and well across the domains of work and play, and in contrast to many users, are using the computer to extend their interests and abilities.

Other information habits we observed in Elmhurst children may be harder to cultivate in the digital medium, but may be all the more necessary for this reason. In fact the digital medium, with its endless succession of screens, with the ubiquity of links that are forever branching elsewhere, with its general tendency to disperse attention laterally rather than encouraging cumulative sense-making, with its wide-open content from all kinds of sources, demands these habits more than other, more traditional linear media. Habits such as slowing down, scanning pages, checking for meaning, posing questions to oneself, and thinking about the sources of the information one finds are critical in these media, as never before, many commentators claim. Sutherland-Smith (2002) reported that when students interact with text resulting from an Internet search they "perceive Web text reading as different from print text reading" (p. 664). Readers got easily frustrated when they didn't find their search for quick answers gratified by search results, and often adopted a "snatch and grab philosophy…not apparent in print text environments" (p. 664). In a similar vein, Eagleton (2001) watched middle schoolers who were relatively new to the Internet making "hasty, random choices with little thought and evaluation" (p. 3). Coiro (2003) notes that these "relatively shallow, random and often passive interactions with text are in direct contrast to the active, strategic, and critical processes

of constructing meaning now being proposed by instructional leaders, and supported by 25 years of reading research" (p. 32). Faced with the challenges of online literacy, academics, educators, and library professionals, and even the corporate community, have been calling for a pedagogy of 'new literacies' that involve slowing down, reading strategically, attending to authors' motives and bias, and recognizing the limitations of all sources (International Reading Association, 2003). These are the habits that Ellen Wagner and Rene Mitchell and to a lesser extent, Mark Fleischer, are displaying in their computer use.

Taken together, the habits of mind we observed among many of the Elmhurst children comprise an orientation toward digital tools – a posture that is at once bureaucratic and rational, and also warmly expressive. It is bureaucratic because it involves the efficient, instrumental use of tools and routines for impersonal ends. Children in their work and in their play are sorting, sifting, comparing, culling (whether survey information from school, or music files, or effective game play strategies), and often translating, transforming and transferring them to others. Their aim may be to get an "A" on a science project, to get to the next round of Myst, or to manage an over-abundance of IM conversations happening all at the same time. But in analyzing and applying routines that make information more effective for themselves and others, they are practicing essential skills that are the basis of the modern bureaucratic, informational workplace (Reich, 1998). At the same time, many Elmhurst children appear to experience these activities as closely related to and expressive of themselves, their interests and their moods.
They involve the experience of mastery — a sense of confidence about themselves and their capabilities – and not just cognitive skill. Children in Elmhurst frequently expressed enjoyment and confidence in their ability to figure things out with digital technologies (sometimes even when that confidence appeared to be unfounded) and a willingness to 'mess around' with the computer, as one boy put it. More than Southchester children, they identified the computer as an amplifier of their personal interests, hobbies and passions (as we saw in Chapter Three with the Elmhurst children who used their computer for 'creative recreation'). Their affective interests might be writing pop songs for a teacher's approval, building a robot with a friend in order to win a regional

competition, or harassing other children online to stave off boredom. But in these uses they are learning that information tools are tools for them – that they are extensions of themselves and their interests. This orientation – as much as the specific skills they are developing -- will likely be of use in the bureaucratic and information-oriented workplace that prizes skills of 'symbolic analysts.'

From what sources do Elmhurst children derive their greater digital literacy? Some of the factors that appear to support their development of higher order information skills include their more regular, robust access to the Internet; social networks that include nearby adults who are more knowledgeable about computers and solving computer problems; and school assignments that call for them to use the computer and web not just as typewriters or one-time sources of information, but that ask them to use them as information tools in longer-term projects that involve storing, retrieving and revising or otherwise manipulating and communicating information.

But these factors are of themselves insufficient to explain the differences in digital literacy and computer use that we observed within the two communities. Up to half the children in Elmhurst displayed significantly greater skills with digital tools than their suburban peers. These are by and large the same children who we saw in Chapter Three pursuing a range of richer, more varied computer tasks, including creative recreational computing. The more we looked, the more we found that parenting appeared to be the key difference between the lives of these children – and not just parenting around the use of technology. To be sure, these children have parents who tend to be knowledgeable about computing and the Internet, and they can and do help through direct teaching, indirect modeling, and talking to children about computer and Internet use.

However we found in all households that parenting around technology was just one element of a larger parenting orientation. In all families, technology was partly symbolic. It middle class homes, it often became a focal point of parent-child struggles over adolescents' emerging autonomy, and the boundaries of parent control. Some middle class parents embraced the ambiguity of the computer, recognizing that it was a medium

their children needed to explore and learn about on their own, as well as a medium whose use they needed to keep an eye on, and at times intervene in. Other middle class parents mostly ceded the medium to their children, to use and define. In middle class homes, as children and parents sought to use and define the computer and Internet from their own vantage point and interests, new pressures on parenting and family life emerged.

In working class and poor families in Southchester the computer and Internet were equally symbolic – but in a different register. In working class immigrant homes, it might serve as a locus of parents' aspirations for working class and immigrant children – a symbol of their full participation in American society. Here, the computer was less an element of the parent-child struggle over autonomy and control, than an expression of parents' hope for children to gain footholds in the larger worlds of school, work and American life. In this context, the computer was mostly a positive symbol. Working class immigrant families with a great deal of hope for their children, and a belief in their own capacity to help children gain the necessary footholds, saw the computer as one such foothold. These same beliefs led parents to monitor children as closely as they could, to insist on the primacy of school work over recreation, and to engage in as many collective and collaborative family activities as they could, including with the computer. However in some working class and poor families, the computer's role could also be negative – in symbol and in fact. For poorer families, where financial and health problems might be overwhelming, leading to the erosion of hope for children's futures, media were sometimes used as modes of coping and escape, hence in more passive, isolating ways. Children in these homes were left to their own devices in using the computer, sometimes late into the night. In poor homes, a donated computer might also become a charged symbol of the family's economic dependence on institutions of the welfare state, hence a focal point for feelings of exclusion and resentment. Technical problems with the computer could be seen as reason to be suspicious of the motives of donating agencies, leading to a further erosion of trust, and hope for children.

Hence, differences in parenting orientation appear not just across but also within each community, and have important consequences for the kinds of literacies – and

opportunities – that children are developing. It is to these differences that we turn in Chapter Six.

Chapter Six

The Parenting Paradox:
Digital Media and Parenting in Working and Middle Class Families

In Chapters Three and Five we mapped the technological habits and literacies of middle and working class children. We saw that, overall, the working class children were developing a 'scribal' orientation toward digital tools, while many of the middle class children were developing more active, information-literate habits with the tools. We saw in Chapter Four how these differences in uses and skills were partly rooted in structural differences between the two communities – the safety of neighborhoods, the resources of families, the technological skills of adults, the jobs parents had, the practices of local schools. And we speculated that, carried forward into school and the workplace, these different orientations and skills would likely reinforce class inequalities. Middle class children, our data suggested, are learning to appropriate digital tools in individualistic, instrumental and even expressive ways that will likely serve them in the digital workplace, while working class and poor children, even when they have access to computers and the Internet at home, are not. If middle class children are practicing being 'symbolic analysts' at home, the working class children in our study are practicing being, at best, administrative assistants.

At the same time, we saw ample evidence of countervailing trends: In middle class homes, some children spent many hours in online chats, the content of which their parents would likely disapprove; others were such constant 'multi-taskers' that they had difficulty managing their time and attention, and routinely did not get their homework done. In working class and poor homes, some children of immigrants used the computer for practical/ informational tasks that furthered their individual and collective opportunities, while others used the medium mainly as a means of coping with, or escaping, dire household circumstances.

In short, there are important within community differences in children's computing and its consequences. In order to understand these we need to look carefully at the 'social

envelope' of children's computing – in particular, household parenting styles and orientations and how they affect, and are affected by, children's media use.

Giacquinta, Bauer and Levin (1993) examined academic computing in middle and upper middle class homes in the New York City area from 1984 to 1987, and found that middle class children engaged in very little academic or other educational computing at home, preferring game playing far and away the most. They attributed this above all else to their other major finding – parents' lack of encouragement and involvement in their children's computing. Of the different varieties of parental involvement they see as possible – provisioning (providing working hardware and software), praising, modeling, coaching, and scaffolding – parents typically engaged only in provisioning, and occasionally in praising children; seldom did they model computing behaviors, coach children, or provide scaffolding that would help them accomplish core tasks.

The findings of my study differ from Giacquinta's in important ways. First, as we saw in previous chapters, children in this study in fact do far more academic computing, relative to their non-academic computing, than those in Giacquinta's study. This is especially true of immigrant children in Southchester, whose school-related computing outstripped their leisure computing, even if it was most often 'scribal' in nature. On the other end of the spectrum, middle class Elmhurst children do, like the middle class children in Giacquinta's study, pursue more leisure than academic computing; however we found that those Elmhurst children in upper-track classes did in fact use computers at home to work on more complex academic tasks involving spreadsheets, graphic presentation software, etc.

Even more striking however, I found parents playing far more active and complex roles in relation to their children's home computing than Giacquinta et al did. Troubleshooting is one area I have examined in some detail, an area where middle class parents' resources of personal knowledge, and social network knowledge, helps middle class children maintain quality computing, while working class families' lack of this knowledge hinders computer use. Also, as this chapter details, I found differences in parenting within as

well as across middle and working class families, differences that, coupled with other resources of human and social capital, may have significant consequences for children's skills and opportunities in the future. In Southchester, many immigrant parents stressed provisioning, praising, and monitoring to the extent they could, even if their lack of computer experience prevented more direct forms of influence. Meanwhile, Southchester parents living on public assistance and grappling with financial and health problems were modeling uses of media – but largely as means of coping with and distracting themselves from often overwhelming problems. In Elmhurst, I also found quite striking differences in parenting around digital media. Even though the computer and Internet make direct monitoring and involvement difficult, some middle class parents were in fact quite involved in their children's computing in a host of more indirect ways – deliberately placing the computer in a location that was public rather than private, using software controls to limit children's time online and the sites they could visit, modeling and coaching children in the uses of new software or in Internet searches, and talking with children about the nature and limitations of the medium, and helping them learn to monitor themselves in using it. Meanwhile, other middle class Elmhurst parents did few of these things, preferring to allow their children to find their own way with media; indeed, in these families, children were largely in control of digital media, using them for long hours, often to the consternation of their parents, and in ways their parents felt powerless to limit or control.

This Chapter explores these parenting differences in depth, and places them in the wider contexts of middle and working class parenting practices that help shape what class is today and how it is experienced. Giacquinta's framework, which sees parental involvement on a continuum from provisioning to scaffolding, is too narrow for this purpose. We need a richer framework if we are to grasp the dynamic struggle between parents and children over the 'social envelope' of home computing.

Lareau's Framework for Understanding Parenting and Social Class

A more useful framework is offered by the work of Annette Lareau, in her book Unequal Childhoods: Class, Race and Family Life (2003). Lareau, working in the theoretical

tradition of Pierre Bourdieu, holds that social class coheres through broadly shared cultural practices related to education and the shaping of language and experience in children. In Unequal Childhoods she describes how middle class and working class/poor families enact different patterns of childrearing that have important consequences for children's life chances. Middle class parents pursue a logic of 'concerted cultivation' in which parents actively assess and encourage children's talents, opinions and skills. Poor and working class parents pursue the accomplishment of natural growth, in which adults care for children and allow them to grow.

Based on intensive ethnographic work with 12 families, Lareau argues that these two patterns of childrearing are marked by distinctive ways of organizing daily life, using language, and interacting with institutions. In middle class families, she finds, adults actively manage children's time and activities; households revolve around children's scheduled lessons, sports activities, and homework routines, often accompanied by a great deal of stress. In working class and poor families, children spend less time in adult-organized activities, and more time hanging out with peers in unstructured play.

In terms of language use, Lareau finds that middle class parents mix directives with appeals to reason, that children often question adult directives, and that there is a lot of negotiation over rules and parental actions. In working class households, by contrast, she finds that adults use directives mostly, with few appeals to reason, that children rarely question adult directives, and that they tend to accept parental rules and actions silently rather than try constantly to negotiate them.

Middle and working class parents also interact with institutions in distinctive ways, Lareau argues. She finds middle class parents criticizing and questioning institutions like school on behalf of their children, and teaching children to do the same. In contrast, she sees parents who are working class and poor displaying dependence on institutions like the school, and expressing a sense of powerlessness and frustration in relation to institutions that their children begin to absorb. She also finds that, in general, middle class children benefit from a convergence between the childrearing approaches of school

and of home, while for working class and poor children, school norms around verbal expression, reason-giving, etc, tend not to be reinforced at home.

The consequences of these different patterns of child-rearing are, for middle class children, an emerging sense of entitlement and more skill in using language and interacting with authority figures; and for lower class children, an emerging sense of social constraint. Following Bourdieu, Lareau argues that, over time, formal institutions of schooling, work and the professions will recognize and respond to middle class children's sense of entitlement and the coded behaviors that accompany it, and will reward these children with scholarships, interviews, and well-paying jobs. Meanwhile they will bypass the working class and poor children who do not display these familiar habits, skills and dispositions. In applying for jobs, for example, the habit of looking the interviewer in the eye (one of the many things she finds middle class families cultivating in children) will likely help secure a second interview, whereas not doing so at all will likely not.

Lareau is clear that, for her, middle class parenting and behavioral codes are not inherently superior to working class codes. Indeed, she points to the many downsides of concerted cultivation for middle class children and families – greater adult stress, more sibling competition and conflict, and children's lesser ability to occupy their own time without boredom. And she suggests that the accomplishment of natural growth confers definite advantages for families, including closer kinship ties and more respectful interactions between children and adults. However, she argues that social institutions of schooling and work value and reward those qualities and characteristics that middle class parents are cultivating in their children -- verbal expressiveness and reasoning skill, comfort in speaking with someone new, a willingness to question official, bureaucratic procedures – and systematically ignore and/or punish those who lack them.[8]

[8] The theoretical import of Lareau's argument is that parenting norms are partly *constitutive* of social class. They do not simply follow from more 'real' engines of social class like income, wealth, education or racial differences; rather they are a semi-independent arena in which social class differences are being actively produced and lived. Indeed, she focuses on patterns in childrearing, socialization, and related dynamics of institutional exclusion partly because the more traditional markers appear to have declining significance in explaining social class today. In this regard, her debt to Bourdieu is considerable. Parenting norms of

My contention in this thesis is that digital media present children and families with a matrix of varied skill demands and opportunities. Their 'uptake' into families reflects the different social class attributes of those families. Parenting norms and habits are, as Lareau suggests, one important aspect of social class, and I find that they help shape media use. But media use by children is not simply subject to parenting norms and habits. Media – especially digital media, I argue – are problematic in relation to parenting norms, a source of uncertainty and instability. Children, using media, 'push back' on parents and parenting regimes, partly altering the rules of the game. Computers and the Internet have arrived in homes accompanied by the explosive growth of a commercial youth culture (videogames, digital cable TV, portable music players, cell phones) in which adolescents are both key targets (consumers) and also actors (game players, chatters, bloggers, etc.). Media are a dynamic terrain of struggle in which class-based parenting norms are put to the test, as adults and children strive actively to shape uses of the digital medium toward ends they each define as important – leisure, communication and identity for children, and schoolwork and 'safety' for adults.

Moreover, I have found that Lareau's distinction between middle-class norms of 'concerted cultivation' and working class/poor norms around 'the accomplishment of natural growth,' does not adequately capture the parenting patterns I observed in my (admittedly briefer) observations of Southchester and Elmhurst families. The families in this study do follow Lareau's pattern up to a point. Elmhurst children as a group were more occupied with adult-organized activities; were more likely to have extended conversations with parents involving reason and negotiation. Their families were more likely to intervene in school and other institutions on behalf of their children, teaching

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'concerted cultivation' and 'the accomplishment of natural growth' form one part of the *habitus* (background experiences that give people a sense of what is comfortable or natural) that Bourdieu theorizes will shape the amount and form of the resources (or *capital*) that individuals inherit and marshal as confront different institutional arrangements (or *fields)* in the social world. They are thus places where social class advantages are not only produced but lived and experienced.

them this value meanwhile. And the sense of entitlement Lareau describes as a consequence of these patterns was easy to see across a range of these children.

However, as I have suggested, the media use we observed in these homes cuts across, and in part, transforms, each of the dimensions that Lareau outlines – the organization of daily life, uses of language, and interventions in institutions – and as such becomes both an object, and a context, of parenting. (Surprisingly media appear little if at all in Lareau's analysis.[9]) Second and more importantly, families in each community differed markedly along the very dimension of childrearing; there were, in fact, important within-group variations in parenting approach that have, I will argue, important consequences for children's literacy, including their literacy with digital tools, and the wider schooling and work opportunities they will face.

Figure 6.1 summarizes four types of parenting we observed in the two communities. In Elmhurst, we found a majority of parents pursuing the norms of concerted cultivation (in relation to media, as well as more broadly); but we also found a significant proportion of parents following more 'laissez-faire' norms of child rearing. In Southchester, we found working class and poor parents pursuing the accomplishment of natural growth (again, with media as well as more broadly); but we also found working-class immigrant parents pursuing what can be called 'actively aspirational' parenting that distinguished them from

[9] Surprisingly, Lareau largely ignores how parents deal with children's media use. For her, media use is an area where middle and working class/poor children are more alike than different. Chapters Four and V have suggested otherwise. If this is the case, why does Lareau downplay children's media use as a parenting issue? Partly, I believe, it is because she does not look closely enough at the media children are using. Her theoretical orientation and methodological approach privilege observable interactions between parents and children. From this perspective, parenting around media may well look more similar than different across families: most children watch TV and play at least some computer games, and most parents feel their children do too much of these things. If they get into squabbles, especially at transition moments, these squabbles are fairly predictable. In this study, we focused on children's media use, and spent time observing children's interactions with the computer and Internet; this gave us access to the differences in children's media use. Another reason that children's media use may not be such an issue for the Lareau is that she looks at parents of mostly younger children, whose freedom of action with media is rather limited. In contrast, the early adolescents in this study are beginning to assert their independence from parental authority precisely through their use of media that their parents cannot directly monitor and control. Finally, another issue is the simple passage of time. Lareau's data were collected prior to 1995, before the Internet and high-quality graphic video games emerged and came to occupy so much of children's time and attention at home. There is thus a good chance that if Lareau were to conduct her study today, she would find that children's media use was in fact an issue around which middle and working class parenting differed (and, as I argue, around which *within*-class differences emerge, as well).

their poor and working class peers. In the next sections I describe and offer examples of each of these parenting types, and explore the ways they each shape, and are shaped by, children's media use. First we look at parenting in Southchester, in particular the contrast between active aspirational parents and those who pursue the 'accomplishment of natural growth.' Second we look at parenting in Elmhurst, and the contrast between concerted and laissez-faire parents, and how these parenting orientations play out in struggles over children's technology use.

	Concerted Cultivation	Laissez-Faire
	Wagner, Mitchell, Griffin, Verderame, Logan, Christian	**Smithson, Gillette, Fleischer, Prince**
Elm-hurst (middle class)	1-2 income family, busy and time-pressured. Adults strive to closely monitor children's leisure time.	1-2 income family, busy and time-pressured. Adults do not strive to monitor children's leisure time closely.
	Adults strive to manage children's media use, encouraging breadth of exposure. Rules and limits established.	Adults seldom manage children's media use, or worry about breadth of exposure. Few rules or limits established.
	Adults support children's school performance by providing material resources and through constant, active intervention.	Adults support children's school performance by providing material resources, and verbal encouragement
	Adults monitor children's computer use as much as they can. Also engage in modeling and coaching.	Adults generally do not take steps to monitor children's use of the computer. Do little modeling or coaching.
	Adults talk to children about the computer/Internet and its uses and limitations, and about the need for self-monitoring.	Adults rarely talk to children about the computer; they hope children self-monitor.
	Active Aspirational Parenting	**Accomplishment of Natural Growth**
	Cabrera, Allain, Miro, Romero, Munoz	**Broyard, Castillo, Sherman**
South-Chester (working class & poor)	Mostly immigrant parents, one or both working.	Mostly native-born single parents, on public assistance.
	Family busy and pressured. Adults count on children to manage their own time, and make their expectations clear. Late hours.	Adult home, managing care of extended family members. Family members are stressed by health, criminal or substance problems. Time is not much of an issue. Adults do not manage children's time.
	Adults support children's school performance by talking about its importance, but know little about the details.	Adults do little to monitor or support children's school performance. See it as the school's role.
	Adults try monitor children's computer use, but know they are likely missing something.	Adults do not attempt to monitor children's computer use.
	Families use computer together, and adults talk to children about computer safety.	Children use computer alone, and adults do not talk to children about computer or media use.

Table 6.1 Parenting Types Observed in Elmhurst and Southchester

Part I: Parenting in Southchester –
'Active Aspirational' Parenting vs. the Accomplishment of Natural Growth

As we spent time visiting with families in Southchester, we observed two contrasting parenting orientations toward media. In five of the ten Southchester families parents were 'actively aspirational' in regard to their children, while three pursued the accomplishment of natural growth, much as Lareau describes (two were difficult to characterize as either type). As Table 6.1 indicates, the aspirational parents were mostly first-generation immigrants, and working class (meaning one or both parents had a non-managerial job that did not require college-level skills). Most had deliberately enrolled their children in the ASE school (which required an application, and a 'contract' with parents specifying the higher level of commitment the school required) because they believed strongly in schooling as an avenue to their children's advancement. Their limited schooling, low English language proficiency, and their tendency to view school staff as unquestioned authorities might keep them from advocating directly for their children with school staff and other professionals, but at home they stressed the importance of doing well in school, again and again.

In three of the Southchester households parents pursued "the accomplishment of natural growth" – attending to children's fundamental needs, but beyond this, allowing them to interact with peers and siblings however they would, largely unfettered by adult intervention. These households had a somewhat different profile than the immigrant strivers. Two households were headed by native-born citizens, both female. All three were on some form of public assistance, with two families receiving multiple kinds of assistance such as welfare, workfare, and nursing services for ill family members. Only one adult in these families held the equivalent of a full-time job, as a handyman; thus two of the three families would thus be classified as 'poor' instead of 'working class' according to Lareau's (2003) criteria.

In the sections below I describe first the general parenting approach in these households apart from the computer and Internet, including the organization of daily life, approaches

to schooling and achievement, interactions with institutions, and dealing with mass media and youth culture. Then I describe what parenting around the computer and Internet looks like, including beliefs about the value of children's computing, concerns about the computer and Internet, efforts to monitor and influence children's computer use and learning. We see that aspirational parenting differs from the accomplishment of natural growth along most of these dimensions, with important consequences for children and their media use.

Aspirational Parenting in Working Class Households

Aspirational parents and the organization of daily life

When it comes to organizing daily life and time, the aspirational immigrants in our study often resemble middle class cultivators more than they do working class pursuers of natural growth. They are often busy and time-pressured, for they engage as much as they can in cultivation as well as more basic reproduction, even if their cultivating efforts are limited by circumstances of money, time, and limited transportation options. In this aspect of parenting, then, the norms (hopes and expectations) that guide them are not so different from middle class cultivators; what is different is their ability to translate these hopes into action consistently. The fact that many of these parents have enrolled their children in the Academy for Scholastic Excellence (which has longer-than-usual school hours, uniforms, and an expressed ideology of self-improvement through hard work and self-discipline) is itself an expression of their aspirational orientation, and because of the long hours, another reason their lives are time-pressured.

The Colemans, parents of 12-year-old twins Amara and Derek, are a good example of an aspirational working class family. Mr. Coleman is a Jamaican immigrant, while his wife Janice was born in the US. Janice, responsible for most of the care-giving, describes the time pressures she faces in this way:

> Janice Coleman: Time, time, time. I just don't have time. I'm like constantly jumping from one thing to the next in here. I don't get any help unless I start yelling and ranting and raving and it's like, I have to maintain everything. Cook, clean, shop, organize, whatever needs to be done. And back and forth with them. Like today. Some days they have to go to

> school at different times, one has to be one place and one the other place…. I don't really have a *major* social life, but then I help my girlfriend at her store, the one in Harlem, she has her own store. Sometimes I open and close for her if she's out of town, or if she wants to do a out-of-the-store function, she stays in the store and I do the function for her and stuff like that. … What I'm finding is happening to me is that, there's so much running for a period of time, anything that I sit down to do, I begin to get tired, like sleepy, lethargic, lazy. It's like, ok, well if I get up I can finish doing something else, if I'm moving. But just to sit there, it just like, I won't get it done. I feel I should be trying to work on the computer, you know, to learn it so I can help them, but I really just don't have the time or the energy if I ever think of it.

Despite her busy schedule, Janice works hard to try and engineer opportunities for her children outside of school and home. She describes her effort to organize her children's leisure so that they can take advantage of adult-organized activities as a mixture of aspirations, efforts, and barriers of time and money:

> Mrs. Coleman: With the kids, we used to be involved in a whole lot more stuff, but as they get older, once they were in ASE they don't have that much time. Like now, she wants to dance. They both used to go to karate; he plays basketball in tournaments during the summer, in their free time. There are other things they would like to do, but with their schedule, it just doesn't allow it. For instance, there is a brother that has a photography course for youth in Harlem… and he takes the children and each year they go to Africa or India or wherever. And none of these things are included in the funds that he gets. So we'd have to help pay. But [Amara and Derek] aren't able to do that because it is so intense and so serious, they have to be committed to each meeting. So now what they do recreationally is a lot less. But they're in the choir at my church. So we do church functions on Tuesday night. They get out of school at 5. The choir rehearsal when they were in the smaller choir used to be from 6 to 7, now it's from 7 to 8, and they do that on Tuesdays. We usually do church on Sundays. They have a very good youth program there, but most times we don't even, cause it's in Mount Vernon, we don't get there for them to participate as much. But recreationally, they may go to the movies, because they don't have a lot of down time. And then we do shopping together. That's about it. Food shopping.

Women like Janice were stressed partly because like their middle class counterparts they took an unequal share of responsibility for household and childcare duties (Hochschild, 1992). A gendered division of household labor was evident in nearly all of the aspirational homes. Janice Coleman's efforts to shuttle her children to choir and other activities were made harder by the fact that, though married, she considered herself 'a single parent with a husband.' In addition to the community college classes she took, it fell to her shop, cook and clean for the family, monitor the children and their homework,

drive them to school and church, and make important decisions such as whether it would be good to send them away to boarding school for high school.

> Janice It's not fair to him, but I'm a single parent with a husband. (Laughs). He's really not involved.
> IV: He's too busy working?
> Janice: Well, we'll give him that as an excuse. But basically it's because of his character, it's just who he is. I do it, I handle everything, the decisions. They come to me when they need things.

Aspirational parents and school achievement

Aspirational parents place the greatest stress possible on schooling and school achievement as a route to success for their children. Often they identify lapses in their own education as the reasons their opportunities have been limited, and they vow that children will be better off for having taken full advantage of schooling. Luz Cabrera's mother described her own and her husband's upbringing in Puerto Rico as difficult because of their poor education, and she attributed their financial success in this country to the father's hard work in US schools once they arrived here. The immigrant parents who enrolled their children in the ASE school, with its uniforms, extra hours and attention to discipline, did so, they said, because they believed the school would give their children a chance to get ahead through hard work. "In this country," said Ernesto Miro's father, "you need English, and good education. Then you have good work." "My husband works hard [at his restaurant]," said Estella Romero. "School is a child's work."

Despite their emphasis on schooling, the aspirational parents were not highly involved in nor informed about school matters. This appears to be due to language barriers, and also to cultural beliefs about the authority of teachers. Estella Romero, for example, spoke little English and had a 3rd grade education. In her dealings with ASE, she said, she deferred to the teachers and to her husband, who spoke a little more English. Charles Allain's father, a Nigerian immigrant, seemed to agree. "In school what the teacher says goes," he said. "We're not informed of what they are doing. I have to trust [Charles] to do what he is supposed to."

Aspirational parents did, however, pay attention to their children's school grades. They used grades, as well as teachers' comments at parent meetings, to form an opinion about

whether children were doing well or just 'so-so' academically, and where they stood in relation to their siblings or their classmates. These parents routinely and vocally characterized their children's strengths and weaknesses academically, letting children know what they thought, and how they felt they needed to work harder, or if already doing well, to keep it up.

Aspirational parents and mass media / youth culture

In the more aspirational working class homes we visited, parents expressed deep ambivalence toward mass media. On the one hand, one of their favorite family past-times was watching television or watching movies on the VCR together; most said this was their most frequent leisure pursuit as a family. Parents appeared to value this in large part because it was a family experience – something adults and children did together. These families used the television more socially than other families in the study, in both communities.

Janice Coleman, for example, was often bothered that her husband liked to retreat alone to his media-filled 'den' to watch TV alone. For her, watching TV and movies was something to do as a family, with adults and children together. So mother and children watched a lot of TV together, with the content secondary to the experience of being together.

Int: Do you guys watch any shows on TV together?
Janice: Sometimes they watch movies with him when he gets DVDs from Blockbuster. But we do a lot of MTV stuff back and forth together, and BET. Just like flipping around and watching different things on there. That's the most of what we watch together. Sometimes shows on the WB. What other shows do we watch together usually? Silly stuff, usually.
Amara: Buffy the Vampire Slayer...
Janice: Yeah. Sometimes we watch things like that together when there's time.
Amara: Soulfood.
Janice: Oh, we usually watch Soulfood on Wednesday nights. And then late nights, like tonight… we'll come back in and we'll watch Saturday Night Live, and Showtime at the Apollo, and stuff like that. Then it's time to go to bed to get up for church. We'll watch things like that together.

Their emphasis on parent-child togetherness was also a source of these parents' contrary feelings towards media, especially youth-oriented commercial media culture. These parents said they experienced the lure of youth-oriented TV, games and mass media as an intrusion into their homes and a sometimes a multiple threat – to their own authority, the family togetherness they prize, and their cultural and educational aspirations for their children. The reason is that youth media draw children into a separate, youth-oriented world that adults cannot participate in or control. For example, the Nigerian immigrant parents of Charles Allain describe their children's involvement in TV this way:

> Mr. Allain: That's the kids, young kids. They like to watch it by themselves so that they get the programs they want. Some of those programs I won't watch. I don't like. And so they try to sneak and they go downstairs to do it. And sometimes they do that and they come and tell me that they're doing their homework on the computer. So I know that — they like to watch by themselves so that they get their program, like those cartoons. I've been telling them that even though they speak good English they shouldn't listen to that bad talk, but should watch other programs with good language.
>
> Mrs. Allain: I tell them that too.

What Mr. Allain did about his concern over mass media illustrates a key difference between aspirational working class parenting and middle class concerted cultivation. Rather than try and talk to Charles using reason and persuasion, or to engage him in conversation to elicit more information about his interests and habits (as concerted cultivators do), Mr. Allain tries simply to command obedience from Charles. Even as he does so, it is a strategy that he recognizes often fails.

> Mr. Allain: You saw what happened when [Charles] came in. He asked what is going on, and I told him to sit down so that he could listen to what is going on. But he wants us to give him a synopsis of what is going on so that he can rush downstairs and watch his own programs. So I refused to give him the synopsis of what this is. I asked him to sit down here and figure it out himself and he was angry. He just got up and just left.

Aspirational parenting around the computer and Internet

Aspirational immigrant parents believe strongly in the value of the computer for their children's education and future, but with their limited experience of the medium they

tend to be vague about exactly how the medium might be of value. Amara Coleman's father, for example, spoke with glittering generalities about the computer's benefits:

> Mr. Coleman: The computer is something that introduces… the school is trying to enforce it. They know why. It increases the child's horizon. It makes them to see more than they're supposed to see and that is their education. It gives them the opportunity to know a lot of knowledge that wouldn't have been possible without the computer. It gives them the advantage of accessing knowledge and the rest of the things. It gives them the advantage of acknowledging, you can do it…

However, in trying to get more specific about the advantages computing might confer, he has some difficulty.

> Mr. Coleman: It increases the speed of typing than the rest of them. Spelling too. He's the best child in his class and he knows how to do that without making errors. And he doesn't doubt any spelling. He doesn't doubt it. But if a child says he doubts it, he can get it through the computer. The spelling, the computer is going to give you the correct spelling of any one. So there is a lot of advantages, there are a lot good things about it. And it goes without saying that anything that has that advantage has disadvantages. But I think the advantages are more than disadvantages.

Views of TAA and a donated computer

Aspirational working class parents viewed Technology Access for All's donation of a computer as an unmixed blessing. They consistently told us how thankful they were to TAA for the computer and the training they received. While some criticized certain details of the training, the billing process, or the TAA help line, none tended to see the transaction as manipulative, in the way parents on public assistance did. Indeed, if they had a problem with the computer – if it would not start up properly or crashed in the middle of an operation – they often believed something a family member had done wrong caused the problem. They tended to blame themselves, and their ignorance about computers, rather than TAA.

The child who knew too much: Aspirational parents' concerns about the computer

Aspirational immigrant parents had concerns about their children's computing as well. Chief among them is the loss of parental authority. Their children, they felt, now know more than they do, and about a medium that connects them with an 'adult' world they have little access to or control over. Charles Allain's father puts his dilemma this way:

> Mr. Allain: I think the computer is a way to get ahead for the children, compared to when we grew up. It's a big help and we do appreciate it. They're curious with the knowledge they get from it, and now the next thing is to not go beyond what they're supposed to know. There are so many areas about the computer that we have some problems or difficulties with…something like that, the Internet. My child is very curious about it. Also the TAA people assured us that there are a lot of problems with the Internet. That somebody could go on, without this installed, you know, they could do something to us that they're not supposed to do. So we had the training, which was the one day that gave us the opportunity, and that was the time the control was given to the child. To the two of us, that we can block it. And that blocking, I don't know, I haven't been able to do that. I've tried but I don't know too much about the computer and I don't have much opportunity …to be better. You can learn and block it so that he doesn't have to go beyond what he's supposed to know. So I'm waiting and watching and hope he doesn't understand it.

Mr. Allain's language suggests his confusion and discomfort about the loss of parental control that is occurring around the home computer, since his children know more about it than he does. He is glad that the computer and Internet are a window onto 'knowledge' for his children, but also feels his children are eager to know more than they ought to know from the Internet (they are 'curious' he says). Further, he has been told by TAA staff about the 'problem' with much web material, and the importance of parents blocking objectionable materials using software filters. But he feels unable to act on this responsibility, because of his lack of knowledge, compared to his children. Despite his confusions about the computer itself, this father is acutely aware of and articulate about the contradictions in his parental position:

> Mr. Allain: That's the power of it. [Charles] knows more than any person in the house and the reason is through practice. And of course much of the time he comes back from school and there's no other thing to do than the computer. So he has so much. And he ignores other things he's supposed to do - of course he's always going to go for the computer. I expect that sometimes maybe he doesn't have a choice, he is supposed to use it for homework — maybe we're not informed. We're uninformed, but I know sometimes he plays some tricks on us. We're told he has to do his homework, but the homework is given in confidence. He says he has to get his homework on the computer. That's what he claims all the time. I know the problem - he's just really interested, yes. So he tries to rush online whenever. And he goes in to visit places more than he's supposed to.

The immigrant Southchester parents who were aspirational were also concerned about 'predators' on the Internet – especially for their daughters. Luz Cabrera's mother had heard on the news about children being victimized by people online, and her initial response to the TAA program and the idea of Internet access at home and school was negative. Only when a school teacher assured her that the school would use blocking software did she relax.

> Mrs. Cabrera: The idea of her being at school, getting into the Internet, and I was not going to be there? I said 'No way.' Because these visions I have heard in the news about some not good people talking to teenagers and children through the chat rooms, and involving them in other things that they should not be involved in. So I did not want my daughter to be at that risk. But then I was informed from the teacher, that it was not going to be like that. The program it has like a lock. Sister something… Cybersister.
>
> Luz: It's sitter, mom, not sister. CyberSitter.

Monitoring and influencing children's computer use

a. Placement of the computer. Despite their concerns, Southchester parents did not have the experience or skills to be highly involved, directly or indirectly, in their children's computing. However, aspirational immigrant parents frequently did take at least some indirect steps to limit and/or shape what their children did online. Like middle class cultivators, a major strategy was placing the computer in a relatively 'public' place to better monitor children's use. While parents' options in placing the computer were limited somewhat by the size and configuration of the Southchester households, these parents nevertheless excercised a degree of choice about where to put it. For example, Alicia Munoz's mother felt better knowing that the computer was in a place where she could see it:

> Mrs. Munoz: This [TAA] computer we keep here [in the hall], partly because they share a room, and partly because I can see whomever is doing whatever. So like, for Christmas, or if I'm having a function and people need to come over, we just take it apart and put it in the back until afterwards. But I like it here, because I can see what's going on. [To daughter] Do you like the computer here, or would you prefer it be in your room?
>
> Alicia: No. There wouldn't be that much space in there.
>
> Mrs. Munoz: I want it in here so I can see them. I know when they're online, I know when they're doing homework, or whatever it is that they're doing. I'm really just nosy.

b. Provisioning. These parents mainly supported and encouraged children's computer use by 'provisioning' – buying or otherwise acquiring (by loan or gift from a friend or relative) software, hardware peripherals, and furniture that could hold the computer. Often these were purchased at considerable expense and sacrifice for the whole family. A telling example of aspirational provisioning occurred in the Miro home, where parents bought a toy computer for 4-year-old Nadia so that she would not be left out while her older brothers were busy using the computer for their homework. This field note from a visit to the Miro household suggests how home computing sometimes serves to symbolically fuse immigrant parents' educational aspirations for their children, and their belief in a close-knit family.

> As Ernesto begins his 'tour' of the computer, the entire family is gathered around. Alberto, his older brother and the computer expert in the house, is sitting next to him, and Eva, 10, is watching from behind, alongside her parents. Jose, the father, explains [in Spanish] that he wanted the children to teach him how to use the computer, but that he failed because everyone was always talking at the same time. The family laughs at this. On the floor, 4-year-old Nadia is playing with a toy laptop from Oregon Scientific, one that really works (it has games, keyboarding, spelling, a smart card, vocabulary, printer connections, math applications, and a word processor). Ernesto says his parents got Nadia the laptop because she always wanted to touch the TAA computer when they were using it for homework. "Nadia will know the computer too," says Jose. "She will learn even more than her brothers." Evelia, the mother, is silent, but smiles. [field note]

c. Rules and talk around the computer/Internet. Most working class parents, like their middle class counterparts, said they had rules around children's computer use. Asked to specify them, however, they usually mentioned very general precepts like 'homework comes first.' A few set relatively clear limits on when children could do non-school computing (on the weekends only), but as noted above, even they doubted their ability to monitor and enforce these rules. In two immigrant households, household rules prescribed a clear hierarchy between siblings: the oldest sibling, who was deemed to have the most important school work, got to use the computer first, before his younger siblings (and often last as well, sometimes late into the night).

Parental talk around the computer and Internet in these households was mainly restricted to admonishments to share it with siblings, to make sure homework was getting done, or general warnings about safety.

> Janice Coleman: …first of all, if you're a parent, you must have to control over your child's thought. If your child likes to play on the computer, fine. I allow her to play in the computer sometimes, but sometimes I tell her 'you wanted to write something, write it in the computer so you can re-touch it, right?

Learning the computer / gaining literacies

Southchester parents felt that computer skills were important for their own work prospects. Several had taken computer classes either at local community colleges, community job training centers, or as part of workfare training. In addition, aspirational parents saw their lack of computer experience as problematic because it meant that they were unable to support their children in the ways they wanted. Janice Coleman and several other parents felt a parental responsibility to learn more and 'do more' with the computer, if only for the sake of the children – but she was rather vague about what the 'something more' is.

> Janice Coleman: …I should really just be using the computer more to, how should I say it, just reacquaint myself, or keep myself acquainted with the technology of using the computer. For the kids. To show them how important it is. We're connected everywhere, but really, I don't know, I guess we're not, I guess we're not taking full advantage. Because I don't say that a whole lot has changed differently in how we do things, or what time allotments we have for our activities. They haven't really changed to incorporate the computer time on any given day. I'm sure there's always something more we could do there, or something that we do everyday that might be easier if we did it there.

For these parents, learning more about the computer was a way of helping their children, if indirectly. In this they correctly sensed, I believe, that parental literacy helps to foster greater child literacy with the medium.

Seeking advantages for children via the computer

Finally, as we detailed in Chapter Three, aspirational immigrant parents also encouraged children to use the computer to connect with people and resources outside the home who could help them advance and find more opportunities.

For immigrant parents who have little formal schooling and little exposure to computers, the symbolic fusion of 'computer' with 'opportunity' is particularly strong. Like most

parents, they believed having a computer would offer their children advantages in their schooling. But this belief is readily extended to the larger economy and society. As Juan Romero's father said, "I don't have chances to go to school and learn computers in my country. Here for a job you need computers. It's good for the boys to get in school and home."

Working Class/Poor Parents and "The Accomplishment of Natural Growth"

Parents in the Castillo, Broyard and Sherman households also wanted their children to have educational and eventually job success. In often difficult circumstances they worked to keep children safe, to dress them well enough to keep up with peers, to enroll them in schools they hoped would be good for them. Beyond this, however, these parents differed from the working class parents described above. In our interviews and observations we noticed differences in the organization of children's daily life, in the use of language between parents and children, in parents' interactions with institutions, and in their use of and attitudes toward media.

Children in these families were not supervised and kept track of with the same rigor found in among the immigrant strivers. Instead, they were allowed to 'hang out' with peers and siblings for long periods of time – outside as well as inside their apartments. Jules Sherman and Dina Castillo had the run of their projects and neighborhoods with their friends, and were beginning to ride subways and buses to explore new neighborhoods. We do not have enough data to confirm this, but it appeared that parents pursuing the accomplishment of natural growth spoke to children less than did their Southchester peers, and when they did speak, it tended to be short directives that children rarely responded to directly. (In contrast children in the immigrant striver families often appeared to talk constantly, with adults as well as siblings.).

It is in attitudes toward media and interactions with institutions that differences in working class parenting emerge most clearly. Immigrant strivers, as we saw, enjoy broadcast TV and the computer together, yet are also concerned about negative impacts

of media, so they sometimes talk to their children about this, put the computer in a place where it can be seen, etc. By contrast, in the Castillo, Broyard and Sherman households TVs were watched more individually (they were located in bedrooms as well as living rooms), and computer use was more solitary as well. Parents did not see anything wrong with children spending many hours in front of television or the computer, for heavy amounts of TV viewing and movie watching was the norm for all family members. As we saw in Chapter Three with the Castillo family (who were caring for one severely disabled daughter and another who was using drugs and had been beaten by her boyfriend), media were sometimes used in these families as a means of coping with stressful household circumstances. In this context, children were left to themselves to use media as they wished, and Jules Sherman, Dina Castillo and Sonya Broyard did just this – acting out 'adult' roles via chat rooms, playing online games, and vicariously shopping.

Finally, in their attitude toward TAA (the donor organization responsible for getting their family a home computer). we can see one more important difference between working class parents. While most of the immigrant parents were deeply grateful to TAA for providing a computer and training in how to use it, the Castillos, Shermans and Broyards were far more critical of TAA and its policies. Their view of TAA appeared to be shaped by years of experience with welfare offices and others, experience that had given them an active skepticism about the impulses of help-givers.

The paradox of technical help-giving in a low-income community

Technology Access for All (TAA), the non-profit organization that put computers in the Southchester homes. sought to enforce a particular vision of home computing – what I have dubbed 'civic computing.' Some Southchester families found this coercive and paternalistic. Low-income families want access to the breadth of cultural opportunities that service providers like AOL promote in their advertisements and in the design of their homepages and services; some families experienced computing options that fell short of this ideal as a denial of the opportunity for full social participation.

Certain policies of Technology Access for All (TAA) and the low-cost Internet Service Provider (ISP) appeared to contribute to the technical problems children had, and the suspicions that some families felt. At the outset, TAA had families sign an agreement stipulating that the donated computers were theirs on a probationary basis for one year; only after this period would the computers belong to them. This policy was instituted, TAA said, to prevent low-income parents from selling or otherwise misusing a computer intended for their children's benefit. Many Southchester families resented this policy, however. To them, the idea that they were not to be trusted with a computer was an insult.

> Maurita Broyard: It's already past a year, and they said after a year we can do whatever we wanted with the computer. So it's past a year, why we can't have [AOL]? And the computer doesn't work anyway….. It's already past a year, and plus, since the time they had the computer it was down more than it worked. It wasn't that useful anyway. He told me I couldn't have it, but I haven't answered him yet. And before when they got the computer the first time, the printer worked. Now the printer doesn't work. So he sent me out to get a disk, and he told me a lot of stuff. I've just asked him so many questions. And he just answered me back, like saying I can't do this and I can't do that.
>
> [Fieldnote]

Maurita's comments indicate her frustration with what she sees as paternalism and manipulation by a vague amalgam of TAA and the Intenet Service Provider.

Some families overlooked TAA's probationary policy, but fell afoul of others. A policy that proved problematic for many was TAA's decision to pre-install software on the donated computers making its own homepage, its chosen Internet filter (CyberSitter) and its affiliated ISP, appear to be the only viable options for accessing the Internet. In doing so, TAA staff believed they were providing a useful, safe and low-cost set of information options to the low-income families. But this decision had unintended consequences. When Southchester families encountered problems accessing the Internet through the installed software (as most did), they often turned to widely advertised and ubiquitous AOL startup discs to try and get online. But installing AOL software disrupted TAA's software configuration, often rendering the computer inoperable. This led TAA to issue stern warnings to families not to install any new, non-TAA-approved ISP software.

These warnings were intended by TAA to spare families unnecessary problems, but they were interpreted by Southchester families as paternalistic efforts to constrain and control what they did with 'their' computers.

As we have said, Maurita Broyard is a Puerto Rican single mother of four, living on public assistance. In keeping with workfare requirements, she attends a computer training course in Brooklyn, once a week and she has been going to an office to work several hours a day. "I'm a volunteer. I call it my job," she says, "because I have to be there every day from 9 to 5." It seems clear that Maurita's experience on the receiving end of a welfare bureaucracy color the way she interprets her donated home computer.

> Maurita: What would I tell them? That it's a piece of junk, that they shouldn't offer some kids computers that don't work, that breaks down constantly. Then he tells me that for me to take the AOL off of here, I'm gonna have to take it to them, and they will have to reprogram it or have somebody come here and just reprogram it all over again. No, you can take it with you if you want, cause I'm gonna order me a computer anyway, I'm going to get a new Gateway. I'm waiting for one of my bills to just get a little lower, and then I'm going to order a Gateway and that's gonna be for all of us. This computer's a waste. Can't do nothing on it. You gotta ask permission, you gotta do this, you gotta do that. And it doesn't even have a lot of megabytes. I looked at that, it doesn't even have enough megabytes on it.
>
> [interview transcript]

At the root of these problems lies what could be called the paradox of help-giving around technology in a low-income community. TAA and similar programs that promote access in low-income communities do so out of a belief that the computer and Internet are important tools for educational, social and occupational advancement. When they look at the medium they see what I have called the 'civic Internet' – the Internet as reference source, as conduit to teachers, employers and healthcare providers, to greater awareness of, and maybe even participation in, the local community. They see the computer as primarily a medium of work, productivity and civic communication. In this context, what I have called the 'commercial Internet' – all those uses not related to productive work, like browsing, shopping, gaming, IMing – become peripheral, at best a harmless distraction, and at worst a wasteful use of resources. TAA set up the donated computers

to emphasize the former, civic uses, and to downplay the latter. The websites that they pre-loaded into the browser 'favorites' were not just for children – they include job seeking pages, Spanish-language newspapers, and other sites that might be of use to the adults in the low-income households – but they are all of this 'civic' nature. The computers put into the Southchester homes were in essence 'stamped' with TAA's vision of what low-income families should do with computing.

The Southchester families were sensitive to this -- especially those poorer families who had regular contact with help-giving bureaucracies, such as welfare workers. Some complained that TAA wanted them to have an inferior type of computer to those that 'regular' people had – i.e., to those currently available in the marketplace. They felt that TAA exhibited a paternalistic attitude toward them, and that the effort to downplay access to the 'commercial Internet' was part of this. Southchester parents did indeed want their children to use the computers for school-work, and most reiterated this both to children and to researchers again and again; but they also wanted their computer to bring them the fruits of connection to the wider commercial culture. Their insistence on installing AOL 'over' their TAA software is suggestive in this regard. A comparison between the TAA 'community homepage' and the homepages of AOL and other popular ISP browsers (like MSN or Comcast) is revealing. While the TAA homepage presents a plain brown and blue background and a host of mostly textual option, the AOL, MSN and Comcast homepages offer a visually stimulating mix of graphics, text, photographs and animations featuring pop cultural celebrity gossip, sensational headlines about breaking news, the latest sports, and advertisements for a wide mix of commercial and media products. The design of these commercial homepages reinforces one thing: 'we are bringing you the world' -- the world as constructed largely by and through mass media and commercial culture. It is this world, not just the civic Internet, that Southchester families, like their Elmhurst counterparts, want access to via their home computers.

The home computer emerges here (once again) as a highly charged symbolic object. In Southchester, as throughout the culture, computer and Internet access are felt to be symbols of full social participation – or the lack of it. Restrictions and limitations on

access and use, however inevitable from a practical standpoint (and justifiable from the point of view of help-givers like TAA) are thereby perceived as denials of the opportunity for full participation. The commercial Internet, not just the civic Internet, was meaningful to Southchester families – like everyone else, they want to use commercial browsers to access opportunities they perceived to be part of the wider commercial culture. (This remains so even if the 'opportunities' mainly involve visual or symbolic identification with the powerful cultural icons – celebrities, logos, etc.) The larger point here is that when it comes to having a computer in the home, the Southchester families, unlike TAA, do not distinguish clearly between the civic and the commercial internet – it is one Internet, and the boundaries between these uses and functions are fluid; any attempt to police them feels restrictive or coercive to them.

This said, there was a notable contrast between families in how much they complained about and objected to TAA's policies. Immigrant families who perceived themselves to be successful in securing educational opportunities for their children had far fewer complaints and suspicions about TAA than did families that felt less successful in this regard, and that were more involved with the welfare bureaucracy. While the former families were often lavish in praising and thanking TAA for its help in donating a computer and training them to use it, the latter families were likely to harbor complaints, criticisms and sometimes deep suspicions about TAA and its motives.

Part II: Parenting in Elmhurst – Concerted Cultivation vs. Laissez-Faire Parenting

In Annette Lareau's (2003) analysis, one of the clearest distinctions between middle and working class parenting lies in adults' management of organized activities for children – the premier example of what she calls 'concerted cultivation.' She finds that middle income parents schedule many organized activities outside the home for children in

which they engage with adults other than their parents – soccer games, piano and dance lessons, tutoring, boy scouts, etc. – and that these occupy a dominant place in the organization of daily life, often taking precedence over the needs of adults, siblings, and family harmony in general. A by-product of this, she finds, is that middle class children have difficulty in those periods at home when they have no organized activities. They do not know what to do with themselves and their time, so that boredom and sibling conflict is often a feature of their leisure time at home. She finds that working class children, in contrast, exercise more independence in organizing their leisure time, playing with friends outside on the street, and playing more cooperatively with siblings. They learn to enjoy their unstructured time at home, too, without the same sense of boredom that middle class children experience.

This study chronicles the entry of the Internet-connected computer into the middle and working class domestic sphere, something that had not occurred when Lareau collected her data in 1993-95. One of the consequences, I argue, is that the use of time and space at home is changing, for both adults and children, especially in middle class households with a surfeit of media. Like Lareau, I found that the middle class children pursued many more adult-organized activities than the working class children. Unlike Lareau however, I focus on children who are early adolescents, 7th and 8th graders. For concerted cultivators, parenting new adolescents presents its own peculiar challenges. They are accustomed to organizing and managing their children's activities so as to cultivate their interests and talents; yet they find that as their children begin to mature, they exert their own, independent ideas and interests with greater force, pushing back against their parents' interpretations of what they want and need. Children rebel against the piano lessons they have taken dutifully for years. They refuse to be signed up for lacrosse. They declare that they hate the tutor, and won't go again. Since concerned cultivators believe strongly that their children's interests and preferences matter, they face a dilemma when children refuse cultivation. I found that the default choice, for many of the middle class families I studied, was to let children stay home in the afternoons and evenings, ostensibly to do homework, which had gained a new intensity in middle school. However, what children actually did for a great portion of the time they were at home

was to use media – and specifically the computer and Internet, which enabled them to do what they were most interested in -- interact with peers.

Here is where I observed what I believe is a significant difference between middle class parents. About half of the Elmhurst parents believed that their parental role required managing and monitoring (to the extent possible) their children's use of the computer and Internet and other media. They sought to behaviorally limit their children's media use, and also to help children begin to evaluate media on their own. Concerted cultivation for these parents embraced media use; it included the inculcation of habits and orientations to using and thinking about the computer, as well as television, videos, cell-phones and advertising. And it included children's ability to self-monitor and self-manage their own computer and Internet use.

Barbara Mitchell insisted that 12-year-old Rene use her (the mother's) AOL account when doing homework every day, since Rene, who she viewed as easily distractible, would be better able to concentrate on her homework without the interruption of Instant Messages from friends. But she trusted Rene to switch to her own account when homework was finished, or if she needed to email someone for information about an assignment. Rene, in turn, internalized not only her mother's view of herself as a distractible learner, but at the same time, a self-critical orientation toward the information tools available to her: "I'm not like some kids who can just sit down and do homework really, really fast, and chat on IM at the same time; it takes me a long, long time, and I have to really focus. I'd be dead if I tried to do both at the same time. Sometimes I do email and homework together – that way I can ask people [friends] for help with assignments; but if I got on IM to do that, I'd be dead. I'd just be chatting away, and I'd never get done." Rene, like the other middle class children of concerted cultivators, is learning with her mothers' help to monitor and manage her own use of information tools. A busy, cultivated child, with piano lessons, friends, baseball games, computer classes, Girl Scouts, and lots of homework for her high-track classes, she uses the computer and Internet every day – but in ways that enable her to balance the competing demands on her

–completing schoolwork, interacting socially with her peers, earning money to buy things for herself.

Thus the sub-set of Elmhurst 'concerted cultivators' actively helps their children find a balance between recreational and school-related computing and the other demands in their lives. Five of the ten children were finding this balance – they are in the high academic track, but also spend a great deal of time in online recreation. They appear to balance school and non-school computing fairly successfully, aided by their parents, who set limits on their chatting and game play, get involved in finding good software and websites for their school projects, and teach them how to manage their time and the multiple demands on them.

Laissez-Fair Parenting in Elmhurst

The other half of Elmhurst's middle-class parents did not share this cultivating orientation to their children's media use. These parents had a more laissez-faire orientation toward media. While they were cultivators in some areas (ferrying their kids to soccer games and baseball games and dance lessons, for example), they saw their parental role vis-à-vis electronic media as mainly providing access to resources their children needed and wanted. Lucy Smithson's mother and father held off buying a new computer for as long as they could because their budget was tight; but when their children's complaints grew loud enough – Lucy and her older brothers claimed over and over that the family computer, only three years old, was way too slow for downloading music and couldn't play DVDs – they gave in and bought them a fast, new machine equipped with the best multimedia features: stereo speakers, DVD player, and large-screen monitor. The children soon disappeared into the upstairs bedroom where it was installed, and while their mother expressed concern that Lucy might be engaging in inappropriate online conversations there, she hesitated to talk to her about her concerns.

Mark Fleischer's mother expressed bewilderment at the way her children's use of the computer had overtaken the household, occupying both children until late in the evenings, leading to arguments between them, and sometimes rendering the children

mute and non-responsive when she was talking to them. Yet unlike the parental cultivators (who also described having many of these problems), she said she felt helpless in dealing with them. Indeed, in order to deal with the sibling conflict, the solution she and her husband found was to ask relatives for their extra computer, so that her daughter could have one in her room, and the children would fight less over the one in the living room. This laissez-faire orientation toward children's media use included a tendency to see children's computing, like their music, their movies and their TV shows, as 'belonging to' the children, or to this period of their adolescence. Children's media uses were essentially a set of preferences that, while often mystifying and not very palatable to adults, children enjoyed because they were children, and out of which they would eventually grow.

Middle class parents' orientation toward children's media use appears to have important effects. In Elmhurst the children of concerted cultivators were the ones who pursued the more thoughtful, engaged and 'higher-order' computing activities. Middle class children like Ellen Wagner, Tucker Verderame, Cole Griffin, and Rene Mitchell, whose parents asked them to account for their time on the computer and tried their best to monitor what their children did there, often appeared to transcend their adolescent boredom; they invested time in online activities that related to their hobbies, interests and off-line games, as well as their school-work, and these experiences led to feelings of competence (and as I have suggested, information skills) that other middle class children, as well as working class children, lacked.

Conversely, parental laissez-faire toward children's media use was often accompanied by long hours spent Instant Messaging, web browsing or playing games to the exclusion of other activities. Largely left to monitor themselves, Lucy Smithson, Dawn Gillette and Mark Fleischer sometimes appeared to be simply coping with the boredom that Lareau describes as a dominant experience of middle class kids who have unstructured time on their hands.

In the two sections that follow, I describe how Elmhurst concerted cultivators and laissez-faire parents deal in distinctive ways with two common challenges: coping with time and work stresses, and managing adolescent boredom. As we will see, media are integral to the way these challenges are experienced and dealt with in middle class families.

The Gillettes: Time and work stresses – and media 'relief' – in a middle class family

Unequal Childhoods underscores the stresses and pressures that middle class families feel under the regime of concerted cultivation. While parents of all social classes must juggle the competing demands of providing meals, clean clothing, a clean home, and help transporting children, along with their adult needs, Lareau notes that middle class concerted cultivators face an additional layer of demands: they must also attend to the different interests, desires and interior lives of their individual children. Parents often experience this as impossible pressures on their time.

What Lareau does not remark on is the role of electronic media in the organization of middle class family life and its role in relation to the constant demands on parents' time, labor and attention. Electronic media serve multiple purposes in middle class family life, but one key function is parental time- and labor-shifting. The notion of busy parents using television as a welcome but guilty 'babysitter' of their young children is well established in the culture, but less recognized is how digital media fulfill this time- and labor-shifting role. A description of Gillette family underscores how middle class parents' laissez-faire approach toward media serves functional roles for the family as a whole.

It seems to be established in the Gillette family that 13-year-old Dawn is not a great student, that school is not her strength. "Dawn is smart, but so far she's just doing OK at school," says her mother. "She's not the smartest kid in most of her subjects, but she likes chorus. … She needs a lot of pushing to stay up with her homework." Dawn is in 'Level 3' classes in her heavily tracked school – a middle ground between remedial and advanced classes – and her parents seem to accept this ranking as appropriate. Dawn herself seems to feel that she's capable of doing more difficult work, but she is not in a

hurry to pile on more. “Most of my classes I don’t like. My teachers are just – annoying. They give you too much dumb work…. But I think in Level 4 they just give you more and more [work]. I’m not into that!”

Mallory Gillette worried that it is easy for a kid like Dawn who is ‘in the middle’ to get lost in a big middle school, where attention goes to the achievers, or else those at the bottom. But during the year and a half of the study, a tacit agreement that Dawn was a ‘middling’ student appeared to be integral to the way the family as a whole functioned. Both parents worked at full-time jobs in different cities; they described their ability to help her with lots of homework as compromised. Mallory got home after 6pm, after picking up 7-year-old Emma from After School, Jeff got home after 7 or 8pm. In theory, Dawn’s time at home alone between 3:00 to 6:30pm was homework time, but things rarely worked out that way. “It’s hard to stay on her,” Mallory said. “ I call her from work, or on the cell phone, and the message is always the same – ‘No Mom, I don’t have anything today.” But when I get home I find out she’s got this or that to do, and sometimes it’s 9 or 10 at night before she’s getting to it. I’m tired, and I have to help her. Thank God she’s in Level 3; I don’t know what we’d do if she was in Level 4!”

Media were an important part of the tacit agreement that kept the Gillette household functioning during this period. Television, especially, occupied a large place in the household. There is a large-screen TV with cable and pay-per-view front and center in the smallish living room, right about where the hearth is, and the family spends many evenings and weekend days watching together, movies, sports, and popular crime shows. They also retreat to their own rooms to watch alone. Dawn has a TV in her room, and there is one upstairs in the parents bedroom as well. In the afternoons, Dawn is fond of being in her room and watching reruns of cop / lawyer shows - Law and Order, Investigative Reports, Murder she Wrote. In addition to a TV in her room Dawn has a boom box for CDs, and she will soon be getting a phone, and the downstairs computer as well, maybe not with Internet access. “That would be awesome – to have the Internet in my room too. I could just, you know, do everything I want in one place.”

Media, for the Gillette family, appear to be vehicles through which family members can find analogues of things not so easily available to them as relatively new arrivals in Elmhurst. Mallory and Jeff want to connect with people in the town, including around town and school politics, but rather than go to school board meetings or Township Committee meetings ("We just don't have the time!" Mallory says) they like to read and post messages on Elmhurst Online, a rancorous town bulletin board where a small number of citizens engage in vitriolic exchanges on town and school politics. Dawn wants to be a social success among her peers; but finds it easier to watch TV, and to engage in Instant Messaging and chat, where the social risks are lower.

In this context, the Gillette parents, like the Smithsons and Fleischers, are relatively permissive about their children's media use, and their oversight is far less than the other Elmhurst families. Mallory and Dawn have what is more of a peer relationship in their use of the computer, trading off their time on the single computer-dedicated phone line on the weekends, and winkingly acknowledging their superiority to Jeff, the father, when it comes to computer know-how. Jeff, meanwhile, may threaten to withhold computer time as punishment for not doing homework, but he rarely follows through with it. Probing a bit I find from Mallory that she has received notices from AOL about someone with her and Dawn's screen name using inappropriate language on chats. When she talked to Dawn about this, Dawn denied that she had been the one to use the inappropriate language, and said that kids from school had gotten her screen name and used the inappropriate language while masquerading as her. Mallory accepted this explanation. She did not then insist on seeing what the chat rooms were and what kinds of conversations appear there; instead she simply told Dawn not to go to those sites anymore.

The following fieldnote illustrates how, in laissez-faire families, the struggle between parental control and child freedom is displaced onto the physical organization of media space on the one hand, and symbolic gestures around media on the other.

> When I arrive, Dawn is in the den off the living room, behind a large desk with a PC on it. Only one person can sit at the

> computer at a time, but with difficulty I squeeze in next to her, and ask her to begin by showing me her Buddy list. … Jeff Gillette comes in and stands across the desk from us. He can't see from there what is on the screen. Right away he begins teasing Dawn, saying "You're doing research? Well Dawn, tell him how many times you've crashed the computer." Dawn pouts. "It's not my fault!" she says, with mock unhappiness. "Three times" Jeff continues to me, "for her screen pictures, and with her downloads." His tone is put-down teasing. "You're so mean Daddy, I didn't mean to," Dawn says. He tells me, "Luckily, we have five computers in the house." He leaves the room, returns in a moment with a laptop, and reaches across the desk and puts it in Dawn's hands. "There, that'll be yours when we get it going." He seems pleased to be bestowing the computer on her, like a gift. "Oh Daddy, thank you!" says Dawn. It's a heavy PC laptop, an older one. Dawn turns it over and opens it. "Oh this one – you used to use this one." Jeff says, "I can't get it to work. It's got MS-DOS. I've tried installing Windows, from a disk, and I can't do it. I've tried for months." He asks me "Can you figure it out?" When I tell him I can't, since I'm a Mac person, he looks disappointed. All this time Dawn and I are behind the desk at the desktop computer, and Jeff is standing in front of it, a bit awkward in his idleness. When it's clear I can't help fix the computer, he leaves it with Dawn, and says, "Well ok, you can ask your questions." "Thank you Daddy, for the laptop!" Dawn calls after him. When he is gone, Dawn says to me, "He doesn't really get computers. My mom and I know way more than he does." She returns to showing me her Buddies. Fieldnote.

In this exchange we can see several dimensions of the middle class family 'uptake' of digital media, as well as the specifically laissez-faire parenting approach to media. First, in the relationship between Jeff as father and Dawn as daughter, we can see how the computer functions as symbol and prop, a vehicle though which they enact roles and define themselves in relation to one another. Jeff asserts his parental authority by chastising her about her 'immature' behavior with the computer, having crashed it repeatedly. Dawn, in response, adopts a little girl's attitude of acquiescence to his authority. Running against this current, and reversing it, however, is the physical relationship between Dawn and her father. Dawn sits behind the big desk, and behind the computer, in the position of authority, the position of the 'employer'. Her father cannot see the screen, and cannot squeeze around to come on her side (in part his large physical stature itself prevents him from doing this.) So he stands before the desk, a bit awkwardly. There is nothing else to do in this room, really – no chairs to sit in, cluttered shelves around. The one seat of power in the room is occupied – by Dawn. This physical

advantage of Dawn's underscores her advantage in technical knowledge of the computer, a knowledge she does not (unlike some of our male subjects with their mothers) openly flaunt in front of her father. Jeff appears relatively helpless with computers, and perhaps feels this way in parenting an emerging adolescent girl as well. But he doesn't show it; rather he puts on an air of paternal authority, gruff, joking, put-downy. Dawn, in turn, seems to be establishing a zone of independence from parental, and especially paternal, authority. She knows more about the computer, but she does not let on about this openly. She creates a parent-free zone behind the desk from which to play at being a teen, and an adult. But she does so in part by acquiescing in the manifest drama in which he asserts that she is still a little girl and he, her protective and gently abusive father. In this dance, each accomplishes part of what he/she wants, while relinquishing, perhaps, something deeper. Through such dramas and daily, ritual interactions, middle class families enact both their caring, and their indifference, to one another.

Second, we can see the role of consumerism in relation to technology in the laissez-faire media household. Jeff is evidently proud that there are five computers in the household – this is evidence of the abundance he has helped create for his family. He speaks of computer brands and models – ' the Dell I got for Dawn from work', the '486 with multimedia' in a way that underscores their importance as symbols, of speed, of power, of up-to-dateness, rather than as functional items. The family keeps acquiring them, even when – perhaps especially when -- they don't work all that well. This acquisition is part of parenting: bestowing a laptop on his daughter (albeit one that's not working now) is a gesture that does not need explaining or commenting on – this is what parents do, provide their children with fancy technologies. Jeff does not inquire into what Dawn is doing on the computer, the quality of her engagement with it and the people she talks to. Instead, the focus is on hardware: what machine has what new software, how he bought her a computer and she keeps breaking it, etc. We found this focus on technology as 'symbolic abundance' to be a feature of the other 'laissez-faire' cultivators in Elmhurst. The Smithsons and Fleischers both felt their parental role required keeping their children equipped with 'the latest and fastest' computer, and though both felt overwhelmed by

their children's involvement with the media spigot when turned on full blast, neither had any strategies for limiting it, during the time of the study.

Finally, our discussion of the Gillettes has underscored the way that in the laissez-faire middle class family digital media, like mainstream and broadcast media, help 'fill in the cracks' of child care (and spouse care, and sibling care) for parents who are working two full-time jobs, and for whom commuting, shopping, and fulfilling tasks of basic household reproduction render life stressful and exhausting, and leave little room for more personal and engaged forms of cultivation.

Bored.com: Middle Class Cultivation Confronts Early Adolescence, and Media

> "I love bored.com. … Their slogan is 'When there's nothing to watch on television…' You can do all these dumb things, like you can pop plastic bubble wrap … and look at these pictures of guys with mullets!" -- Fiona Prince

One of the websites most frequented by the children in our study, Bored.com sums up a key feature of middle class adolescence. Boredom – experiencing it, avoiding it, coping with it – emerged as a feature in almost every interview we conducted with the middle class children. In a way this is surprising, since the middle class children in the study did not have inordinate amounts of time on their hands with nothing to do. They were busy with school, with organized activities outside the home like sports, lessons and church, and with increasing amounts of homework. Yet in the transition moments between these, and especially in the afternoon/evening and weekend hours at home when they were not programmed, they said they frequently battled boredom, the anxious feeling of nothing to do, in which time hangs heavily like a weight. Lareau (2003) found a similar pattern of boredom in the middle class children in her study when they were left on their own, accompanied by increased conflicts with siblings, and general household tension. What Lareau does not remark on, but what this study found in abundance, was that children's use of media, both mainstream and digital, was closely bound up with their experience of boredom. For the middle class children in the study, using the computer and Internet, like watching television and playing videogames, were both efforts to cope with and manage boredom, and also, frequently, factors in exacerbating it.

Tucker Verderame and his friend Dean describe this mix of media and boredom in the pattern of their activity before they stumbled on their 'Battle Bots' project:

Tucker: It was such a routine. We'd get home, I'd take the dog out, he'd get the snack, we'd come downstairs, play a videogame or computer game for awhile, then watch TV at 4:30, then more videogames, til like 6:30 or 7:00.
Dean: We'd sit there, duhhhhhh… (They both mime being slumped on the couch, with lids half closed and dull expressions - reaching out to flick the channel with an imaginary remote.) It was SO boring. Sometimes I'd fall asleep.
Tucker: It would be a beautiful day out, and we'd be down here in the dark just looking at the screen…
IV: Weren't the videogames or computer games engaging?
Dean: For a while. But then we'd get bored with doing them all the time, too. We played Madden 2001 from Christmas til February. We were so tired of it then.

Quizzed about the reasons for their own and peers' boredom, Tucker and Dean deftly zero in on factors that include internal motivation, school pressures, and media and technology.

IV: What's the problem? Why do kids do what they do - and get so bored?
Dean: Too much technology. (He smiles, but he seems partly serious.)
Tucker: Nowadays kids are lazy. They're not motivated to do anything.
Dean: They're only motivated if people, a teacher, says do this, or do that.
Tucker: Maybe some are tired because of all the things they have to do, and they just don't want to do anything, so they sit around with TV and videogames and the computer.
Dean: Yeah. (Pause.) But most are just lazy. (They laugh.)

Boredom appeared to be a relatively new feature of children's lives in the middle class households, corresponding with the arrival of adolescence. "We didn't used to be bored," said Tucker Verderame. "We just rode our bikes outside all day. And I went to soccer all the time." As children transition from middle childhood with its dolls and dramatic games, its dance and music lessons, its soccer games and recreation camps, they begin to assert their independence – often by actively resisting parents' efforts to program their time in these ways. In more than half of the middle class households where we

interviewed, children or parents described organized activities that children had been involved with for more than a year, but had given up in the past year and a half – piano lessons, competitive swimming, dance classes, theater programs, soccer. "Lucy has done dance since she was really little," said her mother, Sarah. "But this year she just said she was tired of it. And that she didn't like the teacher, Ms. Grant. She was putting too much pressure on them, she said." Sometimes these activities were replaced by new ones that children said were more to their liking – guitar lessons, photography classes, yoga – but often they were not. "[Lucy] is going to sign up for cheerleading camp this summer," said her mother. "It's kind of like dance, I guess, so it's good, she won't be completely leaving it."

Children and parents both said that middle school's more demanding homework was a reason that children quit organized activities they had formerly pursued happily. But at the same time, it is clear from many comments that children's desire for freedom from adult programming is at work, too. "I just have too many things going on," said Rene Mitchell. "All these classes, and they all have tons of homework. Plus chorus, and youth group on the weekend. Soccer was just too much pressure. My dad and I really argued over it. He loves soccer, and he really, really wanted me to keep going. But I won. I hated having to spend all my weekends going to games. I'd never be able to go to sleepovers with my friends, or anything. Maybe I'll start again later – but not next year." Most parents acquiesced, however reluctantly, in the face of continued resistance from their children. "Our whole family is musical," said Carlita Christian, "and Julie is really good at piano. I kept telling her 'Just keep going for a few more weeks.' I was hoping she'd get past all that negativity. But I got so tired of fighting her all the time, every week. And the complaining. So I let her stop. I don't know if it was the right thing to do."

As parents, middle class cultivators, whether concerted or laissez-faire, face a dilemma when children refuse cultivation, and simultaneously complain of boredom. They are supposed to take their children's interests and preferences seriously; yet they are also supposed to insist on cultivation. Many parents had therefore switched lessons and

activities over the years, as their children had grown tired of one after another. But as Rene's father found, when they reach adolescence, children's refusals are accompanied by reason-giving and logic, something else that cultivators feel bound to respect since they have been trying to instill these habits in their children since they were toddlers (Brice-Heath, 1983; Lareau, 2003).

Middle class 'concerted cultivation' around digital media: Coaching and Scaffolding

Elmhurst parents who were concerted cultivators solved the paradox of parenting in creative ways. Tucker Verderame and his best friend Dean appeared to solve the boredom problem on their own, without much direct help from parents; but a closer look reveals how subtle, yet important, the parenting supports they had were. After many months of afternoons simply managing their boredom with videogames and TV, Tucker and Dean stumbled on their Battle Bots project, which would organize the next year or more of their lives. Of all the interesting things they did involved with building a robot to compete in a regional competition, the thing they describe as most valuable to them about the project is the relief it gave them from media-ted boredom.

IV: What's [your Battle Bot project] mean to you? I mean, if you couldn't do the project for some reason, if it just went away, what would you miss most?
Dean: It's getting us away from TV and video games. It's something to do.
Tucker: It's keeping us occupied.
Dean: This is getting us away from all that…usually we were just sitting there bored. This is making us do stuff - go out places, find parts, talk to people. It needs a lot of energy to move it around.
Tucker: We have all this stuff to talk about on the way to school - the show that was just on, new designs, ways we could improve ours.
IV: What is your routine now ?
Tucker: Do the dog, call mom, get drinks.
Dean: Check email. To see if there are any messages from the vendors sending our parts.
Tucker: Go to Coolrobots.com, to see if there are any replies to our questions on the forums.
Dean: And Robotcombat, to check out if there are updates on the recent projects. We're waiting for sites to put up pictures from the most recent event. So we can see what the designs are.

Tucker: We usually spend from 3:30 to 4:15 online. Then we go downstairs, play a videogame.
Dean: And then maybe watch tapes of the shows we've videotaped. Maybe look at our prototype, and talk about it. We're almost always talking about it, features we could have. Other robots we could build.
Tucker: We'll probably build a lot of it this summer. – I'm going away for part of July, but we'll have the beginning of the month, and then most of the month of August when we get back.
Dean: We have to speed up, Trav, if we want to enter in one of the 2002 events.

On one level, Tucker and Dean's Battle Bots project seems to underscore the tremendous challenge of helping middle class media-kids overcome their terminal boredom. For the combination of elements in Battle Bots that offered them an opening is so rare as to be almost unique. Element one is a weekly TV broadcast that is full enough of violent spectacle (the battling robots) that it appeals to middle-school age boys. Element two is the fact that this TV spectacle is the culmination of a months- and years-long process of robot building and competition by ordinary (though nerdy and adolescently-oriented) male adults all over the country. Element three is the fact that this group of nerdy, adolescently-oriented adults has created a set of websites containing tools and supports for robot building – and critically, that the adults on these websites welcome the participation of committed youngsters like Tucker and Dean, not just grown-ups. Tucker and Dean were lucky to have stumbled from element one, the TV show, to element three, the web sites, and to have recognized the opportunity that resided in element two, the community of competitive but supportive robot-builders.

Tucker: You're asking, if I was a parent, how would I help my kid get into something like this? (Pause) You have to ask them. What are they interested in? Go from that. I was interested in this TV show. It turned out to be connected to all this other stuff going on. Now it's something that we can do every day.

If Tucker and Dean were fortunate in stumbling on the Battle Bots project, however, their ability to carry through and succeed with it owed everything to the parental supports they received. Indeed, Jerry Verderame's support for his son's Battle Bot project displays a canny awareness of the problem faced by concerted cultivators of middle class

adolescents. A technically-minded person, Jerry might have offered to steer the project from beginning to end, guiding the boys each step of the way. Instead, taking a cue from his career experience as a project manager in a theatrical lighting company, he approached his son's request for permission and help in building a robot by first stating all the kinds of help he would NOT provide – financing, expertise with engines, power, and design, and overall project management. He made it clear that Tucker and Dean would need to go elsewhere, to other adults, for this help, and/or figure it out on their own.

> Jerry Verderame: I like building stuff, and I was glad Tucker got interested in this. But I realized that if I jumped into it with both feet he'd probably get *less* interested. He's at that age. Plus, the truth is I really *don't* know about 90% of the stuff they need. I could have learned, but what's the point of that? This is about him and Dean, not me.

As a result, Jerry provided his son and his friend coaching and scaffolding, rather than direct assistance. Jerry's concrete help was important, but limited to specific things: helping Tucker set up an initial spreadsheet budget, introducing the boys to people at his office to whom they could appeal for financing, helping them fabricate a structural frame ("That's the part my dad knows something about," said Tucker), sitting down with Tucker to try and figure out a Computer Aided Design program he had at work but had never used before, talking through the project's progress occasionally. Tucker and Dean turned to a host of other adults – neighbors, friends of their parents, and members of the online Battle Bots community – to get the rest of what they needed, in knowledge and resources, to build their robot. In consequence, the lessons they were learning – not just about mechanics, design and technology but about themselves and their capacity to find joy in working alone and with others to identify interesting problems and persevere in solving them – appeared to be considerable.

Discussion: Larger Influences on Middle Class Parenting

Parental attitudes and behavior toward media cannot by themselves account for the kinds of differences we observed in parenting behaviors. I believe that differences in parenting

around media are part of a broader divide in middle class parenting that Lareau's (2003) analysis does not capture. Parents in the study who were concerted cultivators around media tended to be what Robert Reich has called 'symbolic analysts' – well-educated professionals in fields such as lighting design, public relations, and teaching, financial analysis, whose work involves the interpretation and transformation of data from one form into another: a playscript into design drawings, a product description into an advertising pitch, a mathematical problem into a learner-friendly analogy, a stock portfolio's past performance into a projection of future earnings. Symbolic analyst parents are akin to those Barbara Ehrenreich has called the 'professional middle class' (Ehrenreich, 1989). They are more aware than most that their children's career and income prospects depend greatly on education, and what might be called 'habits of mind' – curiosity, experimentation, reason-seeking, expressiveness – since these are the qualities of mind on which their own school and career success so greatly depends.

Because they lack wealth or property that can be passed on to help guarantee children's economic well-being, they are determined to stress the education and credentialization that worked for them. Through high levels of interaction, these parents seek to cultivate qualities of mind, language, artistic expression – the interior life of children, their ways of thinking and feeling about the world – as the best route to success as an adult. We noted that among this group, parental expectations for children's academic and cultural achievement tends to exceed school expectations. Parents see school as only one, and not necessarily a very reliable, avenue of learning for their children. They sometimes spoke dismissively of their children's teachers and classes (in what is generally a very highly regarded school system) – the clear implication being that their own standards of cultivation are more exacting than those of school people. Academic achievement is highly valued, but parents seek it not simply by enforcing conformity with school requirements, but by cultivating internal habits of work and of mind that they believe underlie success. They talk to children about when school assignments are due, and how they should plan in advance to get the work done, parsing it into stages so it gets done gradually. They talk to them about how the work is going, who in a group project is pulling their weight and who is not, and how to negotiate with peers when work patterns

need to be changed. They strategize with them when, overwhelmed by too much work all due at the same time, they need to prioritize, talk to teachers about getting things in late, and generally manage an over-complicated 'adult-like' childhood.

These parents monitor children's external behavior – seeking to keep them safe—but they also take responsibility for shaping their internal life. Their goals in parenting embrace the ideal of autonomy for their children, and hence they are aware of the paradox in parenting: that while one is raising children and seeking to teach them good habits, they must forge their own ways of doing things, make their own mistakes, and learn from them – they must become self-monitors. Parental monitoring must engender self-monitoring. Their chief tool in this task is talk – they are endlessly making decisions and distinctions, justifying them, and implicitly, asking children to do the same. They have a capacious view of the contents of learning – all of culture is fodder for the making of distinctions and the justification of them via personal and abstract criteria: family relations and interactions, popular culture (mostly a waste of time), music, news, history, breakfast cereal. They reach into their children's worlds, and seek to understand them enough to help their children engage with them critically and creatively. This includes toys, TV, and the computer.

Digital media, for these parents, are neither necessary adjuncts of school and workplace success, nor are they simply 'children's entertainment' media. These parents tend to recognize the computer and Internet as the hybrid entities they are – offering benefits to learning and work, offering harmless entertainment, but also offering potential sinkholes of time wasting, and worse. As Bethann Wagner put it, "At it's best it's a fantastic tool. At its worse it's a substitute for critical and creative thinking."

Not insignificantly, parents in symbolic analyst households use computers and the Internet more expansively in their work than the more laissez-faire cultivators. They appear to know more of the medium, and they know it more intimately, in its virtues and drawbacks, than do their middle class peers who are not symbolic analysts. This colors their approach to their children's use of the medium. They exercise some control over

their children's access to the medium (e.g., using AOL's parental controls, placing the computer in visible areas), but in a larger sense, they are aware that their children need to make their own judgments and they talk to them about the medium and its uses, benefits and problems. Children in theses families face decisions about how much to self-monitor in their use of media, how much to adopt their parents' criteria for accepting or rejecting an aspect of the medium (chat rooms, e.g.) – and they know they face these decisions.

Middle-class parenting that was more laissez-faire in orientation was marked by several features. First, the more laissez-faire middle class parents tended to be employed in lower level white-collar administrative or service work that did not call for the same level of symbolic analysis, and entailed some, but not a lot of managerial authority. They were bank officials, customer service representatives, hospital records administrators, and restaurant chefs. When they used computers in their work they tended to use a narrow range of applications to accomplish tasks like accessing and updating patient records, bank account information, or customer profiles. (They also used email and were often conversant with a range of home consumer uses of the computer, like using a digital camera, shopping online, etc.).

Among Elmhurst families, the more laizze-faire parents tended to be in two-career or single parent working families. Time pressures were strongly felt in all families, but compared to the concerted cultivators (who often had one parent with part-time or flexible work), parents in these families had even more limited time at home with the children. With less time to invest in at-home cultivation, laizze-faire parents saw a primary parenting responsibility as providing for children – giving them opportunities to do and have the things they want and need to fit in and be successful -- clothes, music, sports uniforms and equipment, computers and videogames, 'the latest stuff'. Doing well in school was important, but the ideal for these parents appeared to be as much a well rounded child as one who excelled academically: a child who is involved in sports, in music, etc., as well as school work, and who is well-liked. Because both parents in these household (or a single parent) tend to work full-time, adults have an even more limited ability to physically monitor children's behavior and time; children are alone for several

hours a day. Commercial media play a big role in the households for all family members – they tend to 'fill in the cracks' in family interactions and care-giving, for adults as well as children. Parents in these households view digital media through a narrower lens than the concerted cultivators. With less exposure to them as tools of work, communication, and data manipulation, parents see the computer and Internet more in their commercial and leisure aspects. In part, they are viewed as the latest thing to provide, and 'good for children to learn' for later career purposes, for school purposes, and just because they are fun. Parents are aware that there can be excesses in computer use, and they worry about them; they try to exert some control over their child's use (by parental controls or placement) but children are likely to get around these if they really want. The balance of authority and monitoring in these families has tipped somewhat: children are likely to 'push back' or else 'hide' successfully in the face of parents efforts to monitor and control their leisure time and their use of media. Children's greater knowledge of the computer plays a role here: they may use this knowledge to exert power. While concerned, parents may feel overwhelmed and helpless when it comes to influencing their child's use of time, and of the computer and Internet. Children, in turn, are able to get a jump on adolescence, developing elaborate worlds of communication, interaction and experience – right at home -- that their parents have little involvement in.

Whatever role parents' work as symbolic analysts may have in their conduct with children around the computer, it would be a mistake to overemphasize this factor. Skills and values from the workplace are clearly only one of many sources of parenting orientations and choices around media. In particular, we saw evidence that parents' religious values were asserting themselves here as well. Sharon Logan, Terence and Carlita Christian, Barbara and Roland Mitchell, Karen Griffin and Phyllis Prince were all actively involved in their churches and took the children with them to services; with one exception (the Princes) these were all among the group I have classified as concerted cultivators. It is not surprising that an everyday worldview grounded in religious practice and belief would give rise to parental criticism toward electronic media, for official religion often portrays these media as embodying the antithesis of Judeo-Christian values.

In addition, middle class concerted cultivation sometimes depended on parents not working, but rather sacrificing one parent's (invariably the mother's) income so that the family could provide more cultivation opportunities. The Verderames, the Mitchells, and the Wagners were not well-off (they lived in relatively small houses, sent their children to the public schools and had to watch their budget for extras like vacations) but they made choices that enabled mothers to stay home, attend to children, and pursue concerted cultivation more effectively. In each of these families the father worked as a symbolic analyst while the mother, though well-educated and with a history of symbolic analytic work, had decided to work only part time, or locally at a flexible job, in order to spend more time with children. Cultivating children is understood as a critical value for these middle class families, the ticket to their children's best chance at success. The double advantage enjoyed by those middle class parents able to take off work and attend to children full-time or part-time, is that they can both limit children's computer use (because they are home), and also direct and shape their use of digital media.

Chapter Seven

Bringing Technology Home

Home, writes Roger Silverstone (1994, 45) is "the product of our practical and emotional commitment to a given space, and as such it can be seen to be a phenomenological reality in which our identities are forged and our security maintained." This study has investigated children's technology uses and literacies, and it has done so in the home. As such, it has ended by exploring issues of class-based parenting and the changing construction of childhood – phenomena that I argue are being influenced by media and technology in important ways. In this conclusion, I will revisit, and try to connect, both aspects of the study – technology literacy and class-based parenting challenges.

Class-based parenting and challenge of media

The parenting patterns that I document in this study differ substantially from much of the literature on this topic. In particular, the findings of my study are problematic for Annette Lareau and her account of middle class parents as concerted cultivators and working class/poor parents as pursuers of the accomplishment of natural growth.

First, I found some immigrant working class families talking with their children and listening to them in ways that Lareau thinks of as prototypically middle class. These working class parents do not cultivate children by sending them out to others for lessons and getting deeply involved in their emotional lives, but they cultivate them through a warm collaborative family life, spending whatever time they have with children, even if it is only by presiding over a living room where children are doing homework, playing games, or doing chores.

Second, and perhaps more novel in terms of a contribution to the literature, I found a that a substantial proportion of middle-class parents do not cultivate their children in the determined ways Lareau describes, but in their busy work and leisure routines follow a more laissez-faire approach to parenting.

Several hypotheses that emerge from my data add dimension to this contrast within the middle class families, and to the non-Lareau pattern for some poor families. I will briefly consider each in turn.

Hypothesis 1. *Concerted cultivation works less well as middle class kids grow older; hence parents have a harder time enriching their children's education as children age.*

I found that as they entered adolescence, middle class children pushed back against what had previously been successful parental efforts to cultivate them with piano lessons, educational camp programs, etc. Adolescents tended to see these parental choices as a challenge to their emerging sense of autonomy. Somewhat ironically, they asserted their independence by turning to 'their own' media –afternoon TV, videogames, and especially, Instant Messenger chats with peers.

If middle class parents find it harder to cultivate children as they get older, do they therefore stop doing it? My findings suggest that the answer is no. Rather than disappearing, cultivation takes on different forms for older children, at least in some middle class families. Less able to influence directly the content of children's activities (their choice of leisure activities, the books or magazines they read, the TV shows they watch, the music they listen to, the conversations they are having with friends, the websites they visit, the approach they take to homework) some middle class parents engaged in strategic parenting in these areas. First, they found creative ways of setting limits on broad categories of activities. For example, they didn't just set rules about the hours spent watching TV or online, they actively enforced them, either because one parent was home enough to do so, or because they used electronic controls. Second, and even more important, they talked to their children about the choices children were making, and the experiences they were having, in these domains. Barbara Mitchell helped Rene figure out an approach to doing homework that would work for her. Sharon Logan shared with her sons what she found objectionable in the violent videogames they played, and asked them to explain what it was they liked about them. Bethann Wagner talked

Ellen through her upset over an online exchange with a boy who had made her feel badly, pointing out that he probably wouldn't have said the hurtful things he did if the two of them were face-to-face. My findings thus support Meyerowitz's (1985) contention that with the advent of electronic media, socialization is undergoing a shift in definition from the provision of information to the interpretive and evaluational framing of information to which children get exposed, willy-nilly. Thus we should expect that, as childhood activities continue to become more electronically mediated and more symbolic, middle class parenting will become more verbal and more evaluational. Middle class concerted cultivators will help their children turn media experiences into verbal ones, and reflect on and articulate their rationales for choices they make, in media and elsewhere in their lives. Cultivation will not disappear, but will adapt to changing circumstances.

Hypothesis 2. *Routine white-collar middle class parents have a different, more laissez faire parenting style than parents with professional middle class jobs.*

Laissez-faire parents in this study were mostly routine white-collar workers (legal and medical secretaries, office managers, customer service workers), while the concerted cultivators tended to be white-collar professionals (financial planners, media designers, lawyers, teachers). One possibility this raises is that professional experience confers an awareness of 'what it takes' to gain entry to symbolic analytical work – e.g., creativity, verbal skill, analytical ability, intellectual flexibility – and that this awareness, in turn, leads parents to cultivate in their children, from an early age, a strong achievement orientation as well as the habits of mind to support it. Normally one would look to educational differences to explain these types of values and behaviors, but in fact nearly all of the middle class parents had college degrees, and the differences in terms of advanced degrees were minor. It is difficult to evaluate this hypothesis without more data, but the results I found suggest that this should be further explored.

Hypothesis 3. *Middle class families with an educated parent at home for part or all of the time are much better able to monitor and organize their children's lives than families with two parents working full-time and commuting.*

In half of the middle class families in this study, an educated female stayed home part time or full time to better care for school-age children. This arrangement was a deliberate choice for these families, one that involved clear economic trade-offs, and sacrifices of prestige for the women involved. Barbara Mitchell was ambitious and intelligent, and for years had been relatively well paid as a full-time teacher, but now worked as a part-time school aide so that she could drive her children to school, help in the schools when needed, and be home when her children returned from school. Karen Griffin, though a single mother, chose not to take a full-time job in Manhattan, but rather to run her financial planning business from home so that she could home-school her boys. Children in these households had adults routinely monitoring their activities, chiding them to practice the piano, asking them to account for their time, and helping them with school tasks and the everyday struggles of managing workloads and relationships. In these families cultivation was not out-sourced to professionals like math tutors and soccer coaches; rather, it stayed in-house, as well-educated adults chose to become 'professional parents' – people who defined their parenting role as the central element of their identity. These 'high-touch' middle class families differ from the portrait painted by Lareau.

By contrast, in middle class families where both parents worked long hours at full-time jobs, children had more unsupervised time at home, at friends' houses, and in transit between school and home. In these households, parents found it difficult to monitor homework, hard to find time to talk to children at length about school and other matters, and hard to monitor and control children's media use. These parents were not unconcerned with their children's school achievement and athletic and cultural accomplishment, but they lacked the time to invest themselves directly in these aspects of their children's lives. Instead, where they could afford to, they purchased tutoring if their child appeared to need help, signed them up for soccer leagues, and kept their children supplied with the latest media technologies for leisure use.

A contrast here emerges between parenting that is 'high-touch,' involving large amounts of direct, close and personal contact with children, and parenting that is more 'remote-

control,' involving the managing of children's time from a distance, with the aid of outside caregivers, and media. Both may be quintessentially middle class, the former stressing personal cultivation, the latter more mediated forms of cultivation available in a consumer-oriented society. In calling the latter 'laissez-faire' parenting I draw on an obvious economic connotation: These parents, home at the end of the day and tired from working and commuting long hours, have little left (of time, of themselves) to give children. Their choice is in part to 'let the market decide' – to do their best to purchase the caretaking products and services they can, and let their children steer themselves through.

Hypothesis 4. *Church-going parents tend to stay more involved with their children's activities than less religiously involved parents.*

One source of the 'togetherness' we found in some Southchester and Elmhurst families was the religious involvement of these families. Religiously-involved parents in Southchester drove children to church in neighboring communities on weekends, called on children to help with church-oriented responsibilities (like preparing flyers using the computer), and sang with children in the church choir. In Elmhurst, church-going parents like Sharon Logan and Karen Griffin, both single mothers, made their church community a centerpiece of their own, and their children's, social lives. This being said, religious language, themes and commitments did not emerge as a centerpiece of subjects' talk about parenting; instead they remained a backdrop.

Hypothesis 5. *Parents who are critical of mainstream mass culture tend to be more involved in children's activities – including their media use -- than those who are not.*

More salient than church affiliation in driving parental behavior, I find, are parents' attitudes toward mass culture. Among middle class parents especially, those who voice criticisms of popular TV shows, music styles, advertisements and celebrities tend to be

the most actively involved in children's lives.10 Sharon Logan, for example, expresses amazement that anyone would have a television set in the living room. ("Putting it there you just get into television for television's sake. All that noise, and yammering, I hate it, it just saps the life out of family time.") Not surprisingly, she strictly enforces limits on her sons' time with videogames, TV and the computer, and she makes sure they practice their instruments, go to church with her, do their homework, and read for fun. Meanwhile, Barbara Mitchell and Bethann Wagner, on opposite sides of town, enjoy turning their biting wit on countless aspects of mainstream commercial culture – TV sit-coms for the attitude of eye-rolling sarcasm they embody, popular magazines and their distorted depictions of women, politicians and the vacuous speeches they give for the media, the notion of 'surfing' the Internet as anything but a waste of time. Barbara, a self-described 'former lefty', sees mass culture as a huge leveling-down of the society, mostly for crass, commercial purposes, but also with morally corrosive and dangerous undertones, especially for her daughters. Like Bethann, she strives to protect her children by sharing her criticisms candidly, and by doing as much monitoring and cajoling as she can muster.

Conversely, parents who find nothing wrong with mass culture – who indeed embrace it as enjoyable and unproblematic – tend to be the least involved in their children's day-to-day lives. Whether we are talking about the Shermans, the Castillos or the Broyards in Southchester, or the Smithsons, the Fleischers or the Gillettes in Elmhurst, those parents who embraced mass culture – who for example put multiple TVs in different rooms, and kept them on for hours at a time – tended to do relatively little monitoring of children's daily activities, and spent less time in close contact with children overall. Given their general embrace of media culture, while they sometimes felt the amount of children's media use was excessive, they saw little problematic about the content of the media their children consumed.

[10] Some parents' criticisms of mass culture doubtless had a religious cast, but this did not appear to be strong. Most parents who were critical of mass culture were thoroughly secular – especially in Elmhurst.

Hypothesis 6 *Unlike other media, children's computer use is especially difficult for adults to monitor, because computer interactions can be hidden from view and disguised as something positive (e.g., homework) when they are really something else (e.g., IMing or web surfing). Middle class concerted cultivators may have therefore met their match in the home computer, a medium whose use by children cannot be monitored or controlled in ways consistent with concerted cultivation.*

My study has documented the many ways that middle class children challenge their parents' oversight of their computing activities, by hiding the screen from view, turning down the sound to disguise IM activity, making up aliases that parents do not know, deleting history files that might be used to track their activities, using parents' passwords to access and change parental control settings, and more. Concerted cultivators in the study admitted that they did not know exactly what their children did online, and that this bothered them.

However the computer does not put an end to cultivation around media use. We have seen that, in the face of the obstacles, concerted cultivators do a variety of things that laissez-faire parents do not. They keep the computer in more public areas of the home, rather than bedrooms, for as long as possible. They use parental controls to establish the parameters of children's use, look periodically at children's files and help organize them, and check history files (when they're not deleted) to see where children have been going online. Most important, they talk to children whenever they can about their own beliefs and values when it comes to computers and computer use. This might include talking about email mistakes they have made, the fun and the challenge of communicating with people you've never met, and rules of thumb like 'always behave with people online as if you were face to face.'

Summing up the hypotheses

To summarize the discussion so far, it appears that several of the hypotheses are indeed plausible, largely because of their strong interrelationships. Two, however, remain more provisional, subject to further investigation.

The first hypothesis – the idea that cultivation changes to become more interpretive and evaluational as children get older, closely complements the last, which holds that the digital medium demands a more discursive, evaluational framing because it is so difficult for parents to monitor directly. These notions are in turn compatible with the idea that middle class cultivators also tend to be more critical of mainstream mass culture than other parents. And finally, all of these activist parental orientations would seem to be greatly facilitated by a well-educated parent who is able to suspend workforce participation in order to spend time at home monitoring, guiding and talking with children about their activities.

To put this another way, it seems that many of the more activist middle class parents view mass culture as a powerful challenge to their role as parents: commercial, media culture will be their children's de facto educator, they feel, unless they intervene. A sense of urgency about simultaneously protecting and fostering the quality of children's minds animates many of their parenting choices, from saying 'no' to a PG-13 movie, to buying kids quality children's literature, to watching TV alongside their child and keeping up a running commentary on it, to vetting all email that enters their child's Inbox, to taking children to concerts, museums, and libraries.

More 'consumerist' or laissez-faire middle class parents may have equal aspirations for their children, but they do not practice these parental behaviors. The apparent cultural abundance of contemporary media may be one reason why. After all, why drive the kids to an actual zoo when ten times a day, with little or no effort, they surf past more compelling views of animals on Animal Planet? Why worry about a PG-13 movie when

it's probably tame compared to the Taxicab Confessions your 12-year-old is watching on HBO when you're out? Why insist your kids go outside to play physical games with the neighbor kids when they're so happy playing networked games on the computer? Why make them go to the library to find books for a school project when they're so good at getting information, so much easier, on the Web? Why take them to a live concert of music you like, when their iPod already contains more songs than could fit on a shelf-full of physical records? Given its remarkable scope, parents who hold an essentially benign view of mainstream mass culture – who are not bothered by it aesthetically, morally, or politically – might be forgiven for thinking have only to get out of the way when it comes to raising an educated child.

Implications for building technology literacy in low-income communities

What are the implications of these findings for organizations like Technology Access for All that provide low-income families with technology access and support?

In order to consider this question is will be useful to recall briefly the 'literacy frame' that has guided my collection and analysis of data on children's computer use. This view sees literacy not as a monolithic property of individuals, but a range of diverse practices rooted in personal, family and community contexts, and utilizing a variety of tools (New London Group, 1996; Street, 1984; Warschauer, 2002).

This view of literacy has enabled us avoid the tendency to dichotomize communities or individuals as computer 'literate or illiterate,' where computer literacy is seen as a singular 'skill' to be acquired. Instead we have seen that individuals, families and communities enact multiple kinds of literate practice with computers, as with other literacy tools. As we have seen, some middle class children – those in families oriented toward cultivation – make active, cognitively sophisticated uses of computing tools for everything from schoolwork to game playing to creative hobbies. Other middle class children – those in families with a laissez-faire orientation – display ample skill with the latest software applications, but use the medium for narrower range of routine, and

arguably more passive, purposes like downloading music, browsing the web, and Instant Messaging with friends.

We have also seen divergent literacies beginning to emerge in working class families and communities. In aspirational and cohesive immigrant families like the Romeros and the Miros, children are developing practical-informational literacies that help them access resources in the wider world (e.g., scholarship, travel information, income through typing), increasing opportunities for themselves and their families. Meanwhile, in stressed families like the Castillos, the Broyards and the Shermans, children are becoming adept at manipulating images and music they download and share with friends, and fluent in the informal verbal codes of Instant Messaging, while developing little capacity to read and comprehend the more formal textual content of the web.

Lessons for technology help-givers: Practical and conceptual

For programs like TAA, whose mission is to increase the participation of low-income families and children in the 'digital revolution,' these findings contain several lessons.

One set of lessons is practical:

• *Provide not just access, but training.* Low-income families, we have found, are removed from the networks of technology expertise that middle class families routinely call upon. Working class parents, as well as children, need help in order to keep a computer working. Training needs to do more than teach adults to turn computers on and run specific programs. It should also: a) show them practical uses of the computer for purposes *they* have interest in; b) provide bookmarks to information resources they want and need; c) give people practice in troubleshooting computer problems, including how to recognize and talk about the key *functions* of computers and their peripherals – connectivity, communication, information navigation.

• *Plan for interruptions of connectivity.* Programs need to recognize that many low-income families will have difficulty maintaining steady payments to service providers,

for they frequently do not have access to credit cards and may be unaccustomed to the email billing that many ISPs use. Because ISPs, unlike phone and cable companies, do not have well-established protocols for dealing with lapses in payment and services, programs should strive to provide a 'safety net' of connectivity where possible.

Another set of lessons for technology help-givers is more conceptual and, I would argue, more important:

• *Do not assume that all low-income families see computers as a way to 'better themselves.'* Would-be help-givers make a mistake if they forget that low-income families hold different interpretations of home computers. Immigrant families like the Miros, Allains and Romeros may see them primarily as tools of work and literacy, useful for bettering their children's opportunities. But others, like the Shermans, Broyards and Castillos, see them primarily as opportunities for leisure, extensions of entertainment media like television, cable, videogames and the VCR. (And as we have seen, many adolescents interpret their home computer in yet another way: as a conduit to conversations with peers and strangers occurring virtually round the clock.) TAA staff saw their mission as fostering 'positive' uses of home computers in low-income households, such as accessing Spanish-language news, information on voting, job opportunities, and municipal services. They 'stamped' the computer with this interpretation (literally, through bookmarks, software installed and the homepage they created), and they reacted with frustration and moralizing criticisms when families failed to embrace, or actively rejected, these kinds of 'civic' computing in favor of browsing commercial web sites and chatting online. A more sensible approach would be to first help families become familiar with home computer uses they enjoy and find comfortable, and then gradually introduce them to an expanded range of computing options.

• *Strive to avoid paternalism in dealing with low-income families.* While some working class and poor families had nothing but praise and appreciation for TAA, others resented what they saw as an inherent paternalism in TAA's approach to them. TAA policies like giving families a probationary year with their computer before it became theirs (a policy

enacted to prevent families from turning around and selling their computers for cash) were seen as mistrustful and infantilizing. TAA admonitions not to install popular and ubiquitous software like AOL on the computer were experienced as restrictive and controlling. In part, these experiences were rooted in a structural reality: families on public assistance were precisely those who tended to view TAA with suspicion, as paternalistic and manipulative. Help-giving organizations therefore need to work hard to dispel what will likely be powerful associations that some families bring to organizations that offer assistance that goes directly to an intimate space like the home.

• *Recognize the limits of strictly home access and support, and involve the school as a partner.* Even for children in enriched middle class homes, school can play an important role in fostering more active literacies. (Recall, for example, that Elmhurst children in the advanced or honors track at were given more cognitively complex homework tasks than kids in the non-honors track, and all Elmhurst children received library instruction in searching the web and citing sources). Low-income children, without the same robust home supports, depend on outside agencies like the school to far greater extent. Programs like TAA need to cultivate local schools, and help them provide diverse computer experiences for students, including homework assignments that call for students to manipulate and evaluate information, not simply re-present it.

• *Acknowledge the powerful symbolic meaning of computers for low-income families, but help them turn the symbol into a reality. To do this, connect training in the use of computers (technological capital) to investments in low-income adults' social and intellectual capital – as well as their financial capital.*

Throughout, this study has underscored the power of the computer as a symbol. For all parents, the computer is symbolic of their children's access to future educational and job opportunities. For middle class children and parents, the home computer is a symbolic site of struggle over the extent of adolescent autonomy and the limits of parental authority. Finally, for low-income and minority parents, the computer remains a potent symbol of participation in – or conversely exclusion from – the wider society.

In chronicling the ways computers are penetrating middle and low-income homes, this study has barely begun to touch on the question of whether and how computers might really help improve the life chances of low-income family members. Recalling the wider view of literacy that I have argued for here, it would seem that homes are rather circumscribed settings for developing the multiple literacies that middle income families already display, and that low-income families need in order to get ahead.

One highly suggestive image of the multiple literacies that working class people most need comes from Julia Coleman, Amara's mother. Julia had taken the TAA computer training alongside her daughter, but said it was too short, and that the trainers went too fast for her to follow. "Anyway they were just showing us how to set it up, turn it on," she says.

What she really needs, Julia goes on to say, is computer training that would help her realize her goal of running a small business as an interior decorator. To be useful, computer training would ideally occur in tandem with instruction in other critical literacies and skills. Note, in this passage, the combination of practical learning and financial supports that she describes as important:

> Julia Coleman: I got to thinking about my business, and about the computer, when I was taking classes in Harlem. I took this one free class run by the Grubmere Foundation, I don't know if you've ever heard of them? It's a foundation that started in India. They started providing very small loans to women to begin their own businesses. But as well as giving these monies, these loans, that would be paid back, they would give them classes. So you learn accounting, a little bit, you learn bookkeeping, you learn how to day-to-day record [with the computer] what it is that you're doing.
>
> [interview transcript]

Only in the context of a course teaching basic business practices does Julia come to realize what the real utility of the computer, and computer-based literacies, might be for her:

> I realized, this is what I need in my [interior decorating] business. Like, people ask me, but I don't have a portfolio, you know, where you have pictures of the things you've done. And also – it's kind of like I'm

> the greatest bargain shopper of all times, but I've been shopping towards changing this bathroom for a couple of months now, but I don't really log things as I'm doing it. Sometimes I change my mind, I may buy something then decide to use other things I have, or if I see something else I might change it. I know that I can use [the computer] more towards keeping an idea, and chronologically listing what it is that I'm doing. That's what I need help with. [interview transcript]

Julia is describing here the reciprocal interpenetration of learning new tools and acting in the world, a circuit we have seen is characteristic of many middle class family members in their day-to-day use of digital technologies, for both work and leisure. John Seely Brown and his colleagues (Brown et al, 1989) have described it this way: "People who use tools actively... build an increasingly rich implicit understanding of the world in which they use the tools and of the tools themselves. The understanding, both of the world and of the tool, continually changes as a result of their interaction. Learning and acting are interestingly indistinct, learning being a continuous, life-long process resulting from acting in situations." (p. 35)

What is unusual is Julia's clear articulation of what it is that she needs – and how different her description is from what is typically encompassed by 'technology training.' Her account even sheds light on the importance of what some have called a 'community of practice' (Wegner, 1999) in gaining new literacies:

> So I was in this course for a year. It wasn't a course, it was a group, we called it. You had to have like, four to six women in a group, they also have men now too. And so each Thursday we would meet for two hours in the morning. We had to keep a log of what was going on. And then in those times that you wanted to borrow money, you had to kind of like write a proposal, but not the formal type that you submit to a bank, but it had to be looked over by all the members, as well as the organizer of the program. It was hard, but good. So during that period of time I did more work, and I took on more assignments.

Julia's is the story of a working class mother hoping to acquire and practice some of the key elements of 'symbolic analysis' (Reich, 1989), using digital tools to enhance a much

wider set of literacies, one that includes tracking finances, writing proposals, editing text collaboratively, social networking, record keeping and creating persuasive presentations. Her experience underscores the multiple kinds of investment that may be required if low-income family members are to use technologies in ways that make a substantial difference in their life chances – investments not just in the development of technological capital, but also intellectual and social capital, as well as financial capital. Without such wider investments in the skills, literacies, and economic opportunities available to low-income adults and parents, we may have little chance of getting 'beyond access' – beyond a limited paradigm in which middle class children and families will continue to increase their economic and social advantages through the use of digital technologies.

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Biographical Statement

William Tally has studied and designed educational media for over 20 years. He is Senior Scientist at the Education Development Center, Inc.'s Center for Children and Technology (CCT) in New York City, a group of researchers and designers exploring the key roles technologies can play in educational change, toward more learner-centered, democratic schooling. With CCT he has studied young people's use of multimedia and network technologies in schools and community settings, has organized professional development for teachers to help them integrate technologies into their teaching practice, and has designed electronic materials for schools, museums and public spaces. Since 1995 his work has increasingly centered on history teaching and learning, and the roles that digital archives of primary sources can play in improving humanities education. He holds a BA in psychology from the University of California at Santa Cruz, an MA in liberal studies from the Graduate Faculty of the New School for Social Research (with an emphasis in American cultural history), and with this thesis, a Ph.D. in Sociology from the Graduate Center of the City University of New York. He is a frequent speaker and writer on issues of education and media. His publications include, among numerous articles, *The New Media Literacy Handbook: An Educator's Guide to Bringing New Media Into the Classroom* (Anchor/Doubleday, 1999), with Cornelia Brunner.