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Laine Nooney, Kevin Driscoll, Kera Allen

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From Programming to Products: *Softalk* Magazine and the Rise of the Personal Computer User

LAINE NOONEY, KEVIN DRISCOLL, AND KERA ALLEN

N SEPTEMBER 1980 THE INAUGURAL ISSUE OF THE Apple II enthusiast magazine *Softalk* opened with a curious declaration from its thirty-nine-year-old female editor, Margot Comstock Tommervik: "*Softalk* is not a programming magazine."¹ It is the sort of statement we might easily overlook if we were flipping through the magazine today, admiring *Softalk*'s hopelessly homebrewed advertisements, fervent game reviews, breathless Apple enthusiasm, and other forms of nostalgia-inducing archival content. But for many microcomputer owners in 1980, Tommervik's pitch for a computer magazine that was *not* a programming magazine likely felt refreshing and expansive—if only because such a thing had never existed.

Since 1975, when the Altair 8800 was splashed across the cover of *Popular Electronics*, and *Byte* launched its first issue with an article on how to reuse integrated circuits, the practice of *owning* a computer had been understood as a uniformly technical hobby (see figures 1 and 2).² The earliest microcomputer owners were hardware homebrewers and software hackers (typically white, typically male) who built and programmed their own machines. Some were inspired by a counterculture ethos of technological freedom, but many others were simply electronics enthusiasts bringing the hands-on hobbyist mentality of ham radio to their newest toys.³ To own

Laine Nooney is an assistant professor of media and information industries in the Department of Media, Culture, and Communication at New York University. Her research specializes in the social, labor, and economic history of the computer and video game industries.

Kevin Driscoll is an assistant professor of media studies at the University of Virginia. He coauthored Minitel: Welcome to the Internet, and runs the Minitel Research Lab, an online archive dedicated to the French videotex platform.

Kera Allen is a PhD candidate in the School of History and Sociology at Georgia Tech. Her research focuses on the history of computing, with an emphasis on the workplace, spreadsheet software, and transnational adoption of early personal computers.

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ABSTRACT:

In the 1980s, the user emerged as a distinct class of personal computer owner motivated by instrumental goals rather than the exploratory pleasures of hackers and hobbyists. To understand the changing values and concerns of microcomputer owners, we analyzed 1,285 reader letters published in Softalk magazine between 1980 and 1984. During this period, a preoccupation with programming was displaced by discussions of software applications, products, and services. This transition illustrates the separation of users from hobbyists, reflecting changes in the software industry and attitudes toward amateurism, professionalization, gender, and expertise.

KEYWORDS:

user, hobbyist, personal computer, magazine, expertise a microcomputer required soldering, fiddling with chips, and thinking in machine code—struggling with the machine for the sheer pleasure of it.

Even when the "second wave" of microcomputers was released in 1977—the Commodore PET, TRS-80, and Apple II—each with its own friendly molded plastic casing, natural language keyboard, and CRT screen output peripheral (in today's language: a monitor), computing was still approached warily by the average consumer (figure 3). "Most adults have a very healthy skepticism and distrust of computers," wrote computer enthusiast and children's author Fred D'Ignazio in the November 1983 issue of *Compute!*, "especially when the 'true believers' market them as a necessity and tout them as a new religion."⁴ For most potential buyers, computing was expensive, unfamiliar, and endlessly complicated. With the exception of a few niche systems, there was no way to interact with a microcomputer without learning how to issue typed commands to the operating system.⁵ "Simpler programming for the pure user [is] the key," counseled one *Softalk* reader in 1981, commenting on the challenges facing nontechnical users. "Most people who want the pleasure and profit of a computer are still out yonder, afraid of Pascal, Basic [*sic*], Applesoft, etc."⁶ As this reader suggests, many people were curious about computers, but the required technical skills were intimidating and poorly documented, a significant hurdle to adoption and diffusion.

Tommervik's entreaty to nonprogrammers in the first issue of *Softalk* suggests a critical, yet underexplored, transition in the history of personal computing in the United States: from computer hobbyists to computer users. In the early 1980s, microcomputing took hold in the American imagination, a technocultural phenomenon captured in a *Time* magazine cover story declaring the personal computer "Machine of the Year" in 1983. Yet the general public struggled to discover just what computers were good for. While existing



FIGURE 1. The Altair 8800 "minicomputer kit" on the cover of Popular Electronics, January 1975.

FIGURE 2. The debut issue of Byte, September 1975. Courtesy Jason Scott, via the Internet Archive.



FIGURE 3. Composite image of (L–R) the Apple II, the Commodore PET, and the TRS-80, all released in 1977. Courtesy Steven Stengel, www.oldcomputers.net.

computer magazines appealed to the expert and enthusiast, *Softalk* provided a unique forum for newcomers, those computer owners less enthralled by the technology than by its practical application. Tracing the historical emergence of these microcomputer *users*, as distinct from hobbyists or hackers, is essential for understanding how the computer became a mass-market consumer product.

In an effort to expand our understanding of this critical moment in the proliferation of US microcomputing, this article traces an ephemeral history of quotidian *use* through an in-depth, data-driven analysis of letters to the editor published in *Softalk* from 1980 to 1984. As one of the few places microcomputer users left behind concrete archival evidence of their individual experiences with hardware and software, *Softalk*'s 1,285 letters to the editor provide a unique yet generalizable corpus for assessing the demography, geography, and content concerns of a user base that shifted markedly during the years in question. As this article will demonstrate, rising microcomputer ownership during this period was not just a straightforward "expansion" of users but also a historical moment of highly condensed contestation over what the ideal functionality of personal computing was. Beginning in late 1982, there is a marked rise in the number of letters discussing software products, such that letters addressing programming concerns became an increasingly smaller part of the corpus compared to *Softalk*'s previous two years. This is a trend we thematize as a shift from *programming* to *products* and through which we register a larger set of transformations, from the *hobbyist* to the *user*.

FROM COMMERCIAL AVAILABILITY TO PRACTICAL USE

It is time industry leaders heard from users about what they want. Software should be idiot-proof and essentially bug free. A well-designed-and-constructed system should be efficient and easy to build, test, install, use, and maintain.

-Hubert M. Hill, Kingsport, TN, letter to Open Discussion, Softalk, May 1984

MUCH OF THE HISTORICAL LITERATURE ON EARLY MICROCOMPUTING FOCUSES ON COMPUTER clubs and hard-core hobbyist groups (both within the United States and abroad), as the very nature of the organized "club" has left behind historical traces in social networks and primary documents.⁷ Yet hobbyists were an extremely narrow segment of what quickly became a vast consumer base of individuals, families, and small business owners, to say nothing of the proliferation of microcomputers into corporations and school districts (which are deserving of their own treatment and will not be addressed in this article).

Many scholars have identified 1977 as the "single moment when the personal computer arrived in the public consciousness," a year marked by both the arrival of the second wave of micros and the first West Coast Computer Faire in San Francisco.⁸ As Elizabeth Petrick writes in her essay "Imagining the Personal Computer: Conceptualizations of the Homebrew Computer Club 1975-1977," "By 1977, the state of personal computer technology had changed. No longer reliant on kits or building a machine from scratch, people interested in the technology could now purchase an off-the-shelf computer and immediately start using it."9 Yet the fact of the "off-the-shelf" market availability of microcomputers should be carefully separated from its consumer *adoption*. What happened when that hypothetical consumer got their microcomputer home, opened the box, and plugged it in? For many people, not much. As Softalk reader Claudine Moffat illustrates, writing in July 1981, "When I bought my Apple Post software twenty months ago, I had long golden hair to my waist. I now have straight grey hair and am almost bald from fighting 'error encountered' problems with the program." Despite its off-the-shelf form, the microcomputer of 1977 was still largely impenetrable to those without prior experience as students, hobbyists, or professionals. Indeed, the market for software products scarcely existed until the release of VisiCalc in 1979, severely limiting the utility of microcomputers for nonexperts. Frustrated by an obtuse user interaction and poor documentation, new computer owners turned to print magazines, how-to books, and instructional cassettes for support. The microcomputer's widespread availability in the United States belied its practical inaccessibility.

If these precise, deeply material historical trajectories have been overlooked within academic writing, it has often been in service of rushing to what is considered the more urgent story of computational ubiquity beginning in the late 1990s and early 2000s. In other words, if we know personal computing became culturally ubiquitous by the early 2000s, what do the granular details and speed bumps of diffusion matter in a grander historical scheme? Yet the assumptions we bring to bear on this earlier moment in time continue to inflect the way we narrativize the rise of personal computing—particularly with regard to its presumed inevitability. The widespread adoption of microcomputing in homes, schools, and offices did not just happen and, despite anecdotal claims, was hardly widespread for nearly two decades. However casually we may point to 1977's West Coast Computer Faire or the release of the TRS-80, the Commodore PET, and the Apple II as the "moment" personal computing arrived, this framing has long served as an argument of expediency rather than one based in deliberate investigation. Furthermore, such claims overlook people's experiences actually *using* computers, as well as the economic and ideological incentives that bolstered computing's presumed utility.

It is a challenging task for historians to generalize about how early consumers used their home computers not only because of the extreme range of microcomputer platforms and products (resulting in as many uses as there were users) but also because of the multifunctional nature of the computer itself. An Apple II or any other popular microcomputer might have been variously employed to balance a checkbook, write a paper, connect to bulletin board systems, or play games. Indeed, this expansiveness of possibilities was often touted as a selling point, a register of the microcomputer's usefulness for the family as a whole. Adding to the challenge of generalization, microcomputers were years away from being a household fixture for most consumers. In 1984, in the United States, 8.2 percent of households had access to a microcomputer; thirteen years later, in 1997, this percentage would only increase to 36.6 percent (although access rates to computers at work and school were much higher).¹⁰ Nonetheless, the early 1980s were instrumental in establishing norms around the use of microcomputing, and this article presents new evidence of the texture and temporality of computer use.

TRACES OF EARLY MICROCOMPUTER USE IN ENTHUSIAST MAGAZINES

There are a myriad of uses which are only limited by the imagination after one becomes fairly proficient in programming. There are programs that my child at eighteen months of age can benefit from. My wife and I can carry on all our correspondence (I was never one for writing letters). We can keep records of valuables for ourselves and for insurance companies.

-David Winograd, Hillsdale, NJ, letter to Open Discussion, Softalk, October 1982

COMPUTER ENTHUSIAST MAGAZINES GREW OUT OF A LONG TRADITION OF PERIODICALS produced by and for the participants in amateur or fan cultures and served a variety of social and technical functions for the microcomputer users of the 1970s and 1980s. For readers, magazines were essential to using one's hardware and software, as they provided documentation, computer literacy, software programs, and a sense of socialization, especially for microcomputer owners living far from user groups or retailers.¹¹ Although much has been made of the computer club, it is likely that for microcomputer owners in the early 1980s, magazines and mail-order catalogs were the primary media through which they attained a sense of support and community, and their letters provide an especially rich space of analysis.

While nearly all computer enthusiast magazines from this period published letters to the editor, *Softalk* maintained an unusually high volume, providing space for dozens of readers to circulate announcements, ask for help, complain, and speculate. Just as letters to the editor in newspapers can offer, in the words of journalism historian David P. Nord, "a glimpse into the past of some actual readers reading their newspapers," letters printed in computing enthusiast magazines offer a glimpse into the past of some actual microcomputer users using their micros.¹² Letters not only provide valuable demographic data of Apple II owners who were also *Softalk* subscribers but also document trends in reader concerns, from the ethics of piracy to the drama of printer compatibility and database selection, and "demonstrate how individuals within the collective participate in the construction and modification of shared values."¹³ Long before the mass adoption of dial-up modems, *Softalk* provided a paper-based infrastructure for virtual community.

To analyze the epistolary discourse of *Softalk* subscribers, we compiled a database from the entirety of *Softalk*'s four years of letters and produced metadata regarding gender, geographic location, content and purpose, dialogue between letter writers, and response rate. Using software-assisted methods, we aggregated these data to analyze and visualize the interests, identities, and concerns of a vocal segment of the population of microcomputer owners in the United States of the early 1980s. The letters published by *Softalk* map a more diverse geography and range of experiences for early microcomputing than can be represented by histories focused on hobbyists and innovation. Together, this discourse outlines the emergent identity of the microcomputer "user."

The "user" has often been considered a troubled category, lacking in medium specificity and routinely taken as synonymous with "consumer," yet we adopt this term precisely because it centers the practices and experiences of computer operators rather than design, marketing, or sales of computer technologies.¹⁴ Unlike other consumer media technologies, such as telephones, radios, and televisions, the microcomputer is unique for the tremendous variation of its implementation and purpose. Some people used microcomputers to advance their own working knowledge of software or hardware. Others simply wanted to play games, or use word processors, or implement database systems in their small business. Some were forced to learn programming to meet their own unique needs but would have likely preferred not to. And others still fell into microcomputing because it was seen as a way of gaining a strategic edge in a swiftly changing, increasingly digitized American economy. While these consumers were indeed "early adopters" in the sense of Everett Rogers's diffusion of innovations model, our emphasis on the emergent "user" identity focuses on the practical problems of domestication, specifically when and how microcomputing entered the home office, den, hall closet, or breakfast nook.¹⁵ Microcomputer users were users precisely because they used microcomputers at a time when use still embodied a complex range of technical proficiencies, self-education, and confusing possibilities. Engagements with these machines could not yet be passive, plug-in-and-play, or reduced to input-output (even if that is much of what mainstream consumer computing has become).

Thus, it is through this alternative orientation that we locate not the iconic inventors and gung-ho homebrewers but the broader market of people whose ways and means of making do with these often strange and indeterminate technologies gave shape to a culture of digital practice rarely given due weight against the more luminous history of technological innovation or computational ubiquity. In pushing for a "user first" emphasis, our analysis productively challenges what Joy Rankin has identified as the "Silicon Valley mythology," which heralds the work of great men such as Bill Gates, Steve Wozniak, and Steve Jobs rather than communities of practice.¹⁶ For decades, our descriptions and imaginations of computer culture have been powerfully shaped by the anecdotal experiences of those who founded or worked in these industries rather than the impressions, actions, or concerns of a broader public. Yet no individual's historical experience is entirely transparent to themselves nor singularly adequate to explain the massive technological transformation that was *learning to live with computers*. By shifting our attention from anecdote to aggregate, this article provides a foundation for deeper journeys into such histories.

In what follows, we analyze *Softalk*'s letters to make a range of contributions to the history of computing in the United States, as well as media studies analysis of computer culture. Foremost, we frame microcomputing not simply as a technology but as a wide-ranging technocultural practice. Additionally, the history we will provide of *Softalk* magazine is a valuable foundation to the underexplored role of computer enthusiast magazines in the 1970s and 1980s. Insofar as this project utilizes digital tools to assess our data, our methodology situates our efforts at the intersection of the history of computing and the digital humanities and offers a model for scholars who may wish to build upon our efforts. Lastly, in summarizing and analyzing our data, we will provide readers with empirical evidence regarding the demographic and geographic range of microcomputer use in the early 1980s within the United States, as well as summary observations on the range of microcomputer use, based on recurring themes and content analysis. The article culminates

by leveraging this analysis to propose the early to mid-1980s as the moment when the impacts of 1977's "off-the-shelf" microcomputers were first fully felt—manifested in the form of a *user* whose desired relationship to these machines was explicitly nontechnical.

WHY SOFTALK AND THE APPLE II?

I also want to comment on how great it has been getting Softalk the last couple of months. I find the articles very insightful, especially the guide to assembly language, and I always read the software reviews.... Thanks, and keep up the good work.

-Peter Neubert, Appleton, WI, letter to Open Discussion, Softalk, May 1984

SOFTALK WAS NEITHER THE EARLIEST NOR THE LONGEST LASTING OF THE DOZENS OF microcomputer enthusiast consumer magazines of the late 1970s and early 1980s, beginning its publication run in September 1980 and distributing its last issue in August 1984.¹⁷ But despite its short reign, *Softalk* has numerous attributes that make it an ideal corpus for our analysis, namely, its platform specificity, its large subscription base, its community-oriented tone, and the sheer volume of its letters section.¹⁸ While the large quantity of published letters was an editorial decision on the part of *Softalk*'s founders, wife and husband team Margot Comstock and Al Tommervik, those letters were also a by-product of the former criteria—the magazine's focus, scale, and sense of distributed community all contributed to making *Softalk* a lively, dedicated space for readers to circulate concerns, questions, and opinions about their computers and their emergent sense of shared culture.

Softalk's platform emphasis on Apple computing, specifically the Apple II, usefully bounds the content while still enabling a remarkable range of topics. By the end of 1983, the Apple II and IIe family had the largest library of programs of any microcomputer on the market, meaning that users were able to interact with the fullest range of possibilities in the world of microcomputing.¹⁹ And Softalk was a popular magazine among Apple users. Comstock and Tommervik made *Softalk* essential reading for Apple II owners by initially offering the magazine for free, basing their subscription rolls on Apple Computer's own mailing list.²⁰ In January 1982, Softalk noted that their subscriber list totaled 60,000; by 1984 the Folio 400 reported that Softalk circulated around 152,000 units monthly, roughly a little over one-tenth of all Apple owners.²¹ While these distribution numbers may seem small compared to the overall installed base, Softalk's inclusion in the Folio 400 testifies to the magazine's significance. And these are strong numbers comparatively: COMPUTE!, which focused on all forms of recreational and home computing rather than specific platforms, had an average circulation of 242,809 in 1983-only 40 percent greater than Softalk's circulation-despite having a far broader range of content.²² Thus, we can ascertain that Softalk was a widely read magazine servicing a thriving community of Apple users whose machines were typically on the forefront of consumer hardware and software development.

In such a consumer environment, *Softalk*'s nonexpert ethos was both a register of changing consumption patterns and a catalyst for that consumption. Distinguishing itself from technically oriented competitors such as *Byte*, *Creative Computing*, *MICRO*, and *Call-A.P.P.L.E.*, *Softalk* privileged "journalistic style rather than technical data" and dedicated itself, in Margot Comstock Tommervik's words, to "piqu[ing] the curiosity and intrigu[ing] the intellect of everyone who owns an Apple."²³ Softalk's populist aims would be reflected in the human-interest content it provided its readership over the next four

years: in-depth profiles of popular companies and programmers, front-page features on figures ranging from R. Buckminster Fuller to Apple president Mike Markkula, multiple monthly contests and puzzles, and tutorial programming columns authored by notable industry experts (figure 4). In all likelihood, Softalk was the first consumer computer magazine reasonably accessible to microcomputer owners who did not program. By personalizing the experience of Apple ownership as entry into a like-minded community based not just in technical expertise, Softalk maintained a readership that ran the gamut from technical to cultural interests. Softalk's contribution to the industry was further solidified by Tommervik's monthly "Top Thirty" list of the best-selling software, a feature that assisted many early software companies in understanding their place in the market.²⁴ In short, *Softalk* functioned in a way that would be quite unfamiliar for a periodical today: it was not just a magazine for Apple users but also a space in which the industry *learned* about itself, with its founders serving as the "social center of the group of software publishers who were most closely associated with Apple computers and game programs."²⁵ For these reasons, Softalk held a privileged place within the ecology of computer enthusiast magazines of its era.

Softalk was a fixture for the Apple II community, a quality most clearly manifest in the magazine's letters section, titled Open Discussion. According to the editors, Open Discussion was intended to be a forum for discussion and debate: "[The] subject matter is what you make it."²⁶ In time, they explained that Open Discussion should facilitate an ongoing dialogue among readers, authors, and editors. "If we run your letters," wrote the editorial staff, "you won't win anything, except, we hope, an answer—from another reader, from a writer, from an editorialist. But mostly from other readers. And you can answer back, too."²⁷ This ambition suggests a more direct correspondence between the letters *Softalk* published and the opinions of microcomputer owners than in other magazines of the period. Together with the editors' commitment to conversation among readers, the letters published by *Softalk* represent a unique set of primary source documents illuminating the concerns, qualms, and aspirations of Apple II computer owners in the early 1980s.

WHO WROTE LETTERS TO SOFTALK?

I'm a novice Apple II owner and also I'm forty-plus years old! . . . One of the most beneficial parts of Softalk to me has been the Open Discussion letters. And as an example I offer this letter. Being the greenhorn that I am I learned from Diane Durbeck's [sixteen-year-old contributor] letter how to use the lower case text of my Epson printer in a relatively simple subroutine. The "old guys" can learn a lot from the young people if we'll just listen.

-Albert E. Hoffman, Lexington, KY, letter to Open Discussion, Softalk, April 1982

THE LETTER WRITERS PUBLISHED IN OPEN DISCUSSION CONSTITUTE A VISIBLE, THOUGH NOT necessarily representative, sample of the overall population of *Softalk* readers and Apple II owners. Yet the content of their letters provides a more detailed portrait of early 1980s computing than can be gleaned from contemporary journalism or the memories of prominent figures. While this corpus affirms many assumptions about computer users of the period, such as the predominance of men, it also complicates simple generalizations about their motivations or concerns. Indeed, Open Discussion gave voice to computer owners who lived far from tech hubs such as Silicon Valley or Massachusetts Route 128.





During the life of *Softalk*, the letters published in Open Discussion recorded patterns of growth and change in computing culture of the early 1980s.

To apprehend the geographic and demographic diversity, as well as the range of interests and concerns of the *Softalk* readership, we conducted a systematic content analysis of letters published in the Open Discussion section from November 1980 until August 1984.²⁸ Across 46 issues, *Softalk* published 1,285 letters from 1,163 authors. Over this same period, the magazine grew steadily in size from 28 pages in September 1980 to a peak of 416 pages in December 1983 (figure 5). As the number of pages grew, so did the length of the Open Discussion section.²⁹ *Softalk* printed an average of 27 letters per issue and peaked at 57 letters in October 1983, making Open Discussion one of the magazine's longest features and differentiating *Softalk* from other computer periodicals. *Softalk* consistently published between three and four times as many letters as higher-profile magazines such as *Byte* and *Creative Computing* (figure 6). The number of letters per issue remained high even as revenue began to dry up. In the magazine's final six months, its size was cut in half twice. Yet *Softalk* maintained an average of 32 letters per issue until the end.

Consistent with nearly all anecdotal accounts of early computing culture, the letters published in Open Discussion were overwhelmingly written by men.³⁰ We classified approximately 85 percent of the letter writers as male, 7 percent as female, and 7 percent ambiguous (figure 7). In an average issue of *Softalk*, just one or two letters would be from writers with female names. Ten issues featured none at all. These proportions did not



FIGURE 5. Relative growth of Softalk and Open Discussion, 1980-84.



FIGURE 6. Reader letters published in Byte, Creative Computing, and Softalk, 1980–82.

change during the lifetime of the magazine (figure 8). However, references to families did appear in the corpus: forty-one writers (3.2 percent of the population) specifically mentioned partners, children, or other family members in the content of their letters. Nine letters (<1 percent) were signed by a couple or a group. While the editorial content in *Softalk* offered a broader range of representations, the letters published in Open Discussion

reflected the socioeconomic and educational privileges afforded to men in computing. Additionally, despite the influx of microcomputers into domestic space, *Softalk*'s male letter writers did not typically frame their microcomputer usage within the larger context of a household unit.

Our analysis did not include race or ethnicity due to a lack of reliable evidence. None of the letter writers disclosed a racial identity or ethnicity, nor did any of the letters discuss racial or ethnic politics in the United States or elsewhere. In the rare instances in which people of color were explicitly featured in *Softalk*, race and ethnicity were never directly politicized. The topic was either avoided entirely, as in *Softalk*'s May 1983 cover story on jazz legend Herbie Hancock, or aligned with a set of social problems that the Apple is leveraged to solve, as demonstrated by the January 1982 article "Eskimos and Their Apples," in which the Inuit were framed as a scattered society in need of connection and communication—and no actual indigenous people were interviewed. While *Softalk*'s editors did dedicate their March 1981 issue to celebrating "women in microcomputing," no such explicit, comparative address of people of color was ever offered. Race remains present in its conspicuous absence, affirming stereotypes regarding the pervasive whiteness of early American computer culture.

Softalk's letter writers were widely dispersed across the United States. While Apple Computer, Softalk Publishing, and many of its advertisers were located in California, the letters published in Open Discussion came from far beyond Silicon Valley, suggesting that microcomputing was growing nationally, not just regionally or coastally, during this time. In four years, *Softalk* published at least one letter from every state in the United States, as well as Puerto Rico and the District of Columbia.³¹ On average, *Softalk* published approximately 2.4 letters per 500,000 people in each state (*standard deviation* = 1.85, *median* = 1.9). California, with its large population and booming microcomputer industry, yielded the greatest number of letters overall, averaging nearly eight per issue. However, twenty-one other states—many with much smaller populations—also produced an above-average number of letters, indicating the growth of Apple ownership across the US (figure 9). These overrepresented states included several with a reputation for high-tech research and industry, such as Maryland, Massachusetts, Minnesota, and Virginia, as well as states such as Alaska, Iowa, Nebraska, and New Hampshire, whose contributions to the history of microcomputing have yet to be examined by historical scholars.

For readers in remote or rural locations, regardless of state, *Softalk* was considered an essential support system, providing access to a network of knowledge that might not have been otherwise readily available within one's town, county, or region. As one *Softalk* reader detailed, "I live in Barstow, California, where there are no computer magazines for sale, never mind computers. Plus I have an Apple at work in my office at Fort Irwin which is thirty-seven miles north of the middle of nowhere. So, I need a little help, please."³² As evidenced, letter writers living far from urban centers commented on the unreliability of retailer access, the importance of mail order, long distances traveled to obtain support, or the desire to find user groups by mail—each topic a testament to both the remarkable spread of microcomputing during this period and the difficulty of microcomputing in isolation. While these letters confirm the significance of California in the history of microcomputing, they also suggest how extensively we have allowed that significance to block out other local and regional histories.

Only forty-one letters (3.1 percent) were sent from outside the United States. The overall dominance of US letter writers reflects both *Softalk*'s primary distribution range (they



FIGURE 7. Gender of Softalk letter writers, 1980-84.



FIGURE 8. Gender of Softalk letter writers by issue, 1980–84.

offered complimentary subscriptions only to Apple owners in the United States and Canada) and Apple Computer's limited international distribution.³³ About half of the international letters came from Canada and Japan, followed by one or two letters each from Australia, Belgium, Brazil, England, Germany, Israel, Mexico, Singapore, Spain, Thailand, Turkey, and West Germany. Most of these authors appear to have been Americans living abroad, including military personnel, thus explaining their access to Apple computers. A letter from a captain in the United States Air Force demonstrates the unique distribution constraints international users endured: "All of my hardware and most of my software has been obtained by mail order. Why? Because I, like thousands of others, am in the military



FIGURE 9. Letters published in Softalk per capita by state (median = 1.9 per 500,000 residents).

and am stationed overseas where the only method of obtaining Apple products is by mail."³⁴ In addition to land-based international users, two letters were sent from readers on ships, including one aboard the USS *Tarawa* and one identified only as "somewhere at sea."

It is difficult to discern socioeconomic class or professional position, aside from being certain that the letter writers themselves were in a position to afford an Apple II (the most expensive of the second-wave microcomputers, costing roughly \$2,500 for a well-outfitted system).³⁵ Anecdotally, many hobbyists were preexposed to computing or electronics through a whitecollar technical profession or workingclass position in electronics repair. Roughly one in ten letter writers included an organizational affiliation in their signature, a majority of which named a microcomputer hardware, software, or services company (79.34 percent). The second most common affiliation was to an educational institution (14.88 percent), confirming the growth of microcomputing across educational sectors during the 1970s and 1980s. The remaining affiliations included military, media, and spiritual organizations. Rather than include an explicit affiliation, some writers disclosed their professional status in the content of their letters; such letters include those from a hospital pharmacist. a "registered professional forester," and an aviator who wanted to use their Apple

II Plus to determine distances between waypoints, calculate fuel consumption, and estimate flight time. These letters offered

a sense of microcomputing's expanding user base, including, for example, medical and dental administrators looking for patient management software, construction professionals, and farmers.³⁶

One of the original goals of Open Discussion was to enable readers to interact with the magazine's editors and writers and with one another. Approaching the letters as a communication network reveals the highly conversational nature of *Softalk*'s Open Discussion forum. Approximately one-third of the letters published in *Softalk* either were explicitly written in response to a previous letter or sparked a response from the editors. Initially,

the editors were very active in responding to reader letters. For the first two issues, the editors responded to every single letter, but over time, as interactions between readers became more common, the editors stepped back from the discussion (figure 10). During the magazine's final year in print, an overwhelming majority—approximately 92 percent—of the letters represented an interaction between readers. More than just a place to make announcements or toss off opinions, Open Discussion had become a genuine forum for *Softalk* readers to engage one another as members of a shared public.

The letters published in Softalk bring depth and texture to our historical understanding of early microcomputer users. Open Discussion participants were largely, though not exclusively, male (the same is likely true of their whiteness). They were dispersed across the nation, and their individual geographic circumstances impacted their experience of computer use. Many were professionals in the technology industries, but there were others interested in microcomputing for personal or professional purposes, including teachers, librarians, and military personnel. And above all, they were eager to communicate with one another. As reader Mike Carlson explained in 1983: "The flow of ideas in continued exchange, challenge, and suggestion is what leads thinkers to modifications, new conclusions, and creative thought. Examined ideas are the basis of much of our rational knowledge, indeed the core of reasoned thought. Unexamined ideas are only to be expected in totalitarianism. Please keep Open Discussion a place for free, spirited quest-our Apple public forum."37 Softalk's letters span hundreds and in some cases thousands of miles, articulating a sense of community organized around shared struggles and aspirations for computer use. To understand the emerging identities of these new microcomputer owners, we next turn to the contents of their letters. We know something about who wrote to Softalk. Now, we want to know why.



FIGURE 10. Replies to letters published in Softalk, 1980-84.

THE EMERGENCE OF THE MICROCOMPUTER USER

Since becoming a new Apple owner in the last six months I am very refreshed at all of the user-friendliness I have come across in documentation, tutorials, and magazine articles. After putting up with directions that are ambiguous, vague, and demanding, it is a nice change indeed to see such a widespread loosening of the ties. Since I don't know who to thank directly, I am writing this to Softalk since many of those responsible will see it here.

-Jim Murphy, Cresco, IA, letter to Open Discussion, Softalk, January 1983

From 1980 to 1984, the shifting topics in Open Discussion reflected the growing and changing population of Apple II computer owners. Specifically, the topics testify to a proliferation in microcomputing's use cases, from the hobbyist-identified tinkering toy or the technical professional's software development tool, to a far more varied range of applications supported by a burgeoning shrink-wrapped software industry. This increase in off-the-shelf uses for a microcomputer supported by software went hand in hand with the expanding constituency of those we would identify as users: microcomputer owners whose investments were not located in the microcomputer itself but in what it might do for them: run database software, drill children in math equations, keep a personal address book, or play games. Distinct from hobbyists and hardcore enthusiasts, users largely desired as little technical engagement as necessary to meet specific professional or personal needs (although even the threshold of "as little as necessary" often proved frustratingly high). Softalk's Open Discussion letters routinely testify to the struggles ambitious users endured as they sought to computerize previously analog corners of their lives. Thus, even though microcomputing was a verifiable monoculture at the level of its demographics, embodied in the stereotypical white male professional, microcomputing's use cases were deeply plural and highly contextual and shifted away from hobbyism within a few years.

To understand the motivations of *Softalk* letter writers, we classified each letter according to a set of nine nonexclusive types describing its tone and purpose (figure 11). A majority of the letters contributed to the collegial, discursive exchange among readers and editors, whether expressing an opinion about an ongoing topic, discussing a product or service, requesting help with a problem, or sharing a technical tip. Additionally, approximately one-third of the letters concerned the magazine itself, including constructive feedback to the editors, corrections to previous articles, and criticism of the advertising and review policies. Often, a single letter had multiple functions, as readers might offer advice, contribute to a debate, and make editorial recommendations, all in the space of several paragraphs. It was in the tendency of letter writers to offer mutual support that we can see the changing character of microcomputing use from 1980 to 1984.

From the start of the magazine in September 1980 until approximately August 1982, letters about programming comprised the single largest topic in Open Discussion, totaling nearly 30 percent of the column's thematic content. These letters addressed programming concepts, languages, difficulties, and tools, as well as offering commentary on the programming tutorials published by *Softalk*. Additionally, these letters often included snippets of code, amendments to previously published programs, and, occasionally, complete program listings.³⁸

The large number of programming letters published in the first two years of Open Discussion encompassed two very different groups of readers with diverging and conflicting relationships to code. Hobbyists and technical professionals wrote to discuss the Apple II



FIGURE 11. Types of letters published in Open Discussion, 1980–84.

as a platform for software development, as they would in a magazine such as Byte. "Anyone who has ever programmed on a bigger machine is bound to be frustrated with any eight-bit CPU, and such 'user-friendly' languages as Pascal are not very useful for writing compilers and operating systems," lamented David Rabson in the June 1983 issue.³⁹ Nonexpert readers, meanwhile, wrote out of frustration at being forced to make sense of the command line in order to make practical use of their new computers. Whether describing themselves as "a real rank amateur," a person of "less than expert status," or a "dumb bunny" who "[does not] know a RAM from a ROM or a Control-D from a GOTO," the letters of nonexperts testify to a vast gray middle ground between the pure novice and the experienced computerist.⁴⁰ Readers with a range of technical skills described programming because they had to, not because they wanted to, as was the case with a November 1981 letter offering a screen dump program for the Epson MX-80 printer: "I am very pleased with the printer but . . . can you believe [the manual] contains a screen dump program for the TRS-80 but not for the Apple?... In all my travels, I was unable to find a simple screen dump program. Out of necessity, I decided to sit down one evening and write my own."⁴¹ Obviously, this Apple II owner, had the requisite programming experience to develop a screen dump program from scratch, but the content of his letter indicates he had been trying to avoid such a task. Even in Softalk's earliest issues, concerns related to programming were neither purely high-end hobbyist chatter nor the residue of a user base adapting easily to the demands of microcomputing. In the early 1980s, microcomputer use was full of friction at every level, and that friction would only grow as a broader constituency of Apple II owners sought out what computing might do for their home or business.

There was no clear threshold or common definition for what constituted technical competency among *Softalk* readers. "Programming" meant many things, and readers' self-assessments were based on a variety of factors, including their own comprehension of technical articles, their ability to troubleshoot their own problems, and their level of

comfort with programming. *Softalk*'s editors described precisely such a user in a response to a letter from an enthusiast who operated from the presumption that all Apple II owners could program:

There are many highly intelligent people whose interest centers on something other than programming; they buy their Apples as tools to aid them in whatever work or hobby commands their concentrated interest. Although such people almost always dabble enough to program simple things, they seldom have any intention of learning to program well enough to create the equivalent of *Gorgon* or their own word processor. Such people may well be perfectly satisfied with being able to key in programs from given listings; it saves them money on software, yet they need not take the time from their primary interests to do complex programming themselves. It is a matter of interest and priorities, not intelligence.⁴²

Intriguingly, what made *Softalk* "not a programming magazine" was not that it excluded programming but that it did not *only* address programming and that its approach to programming was marked by a generous and pedagogic tone.

Softalk was, above all, invested in the Apple as an object of pleasure and curiosity. This is the root of Softalk's extensive cultural and interindustry content, but the magazine also facilitated that experience for readers through numerous tutorials and beginner's features. Up through 1983, Softalk added beginner columns and introductory tutorials at the rate of nearly one every other month; these recurring monthly features comprised the bulk of the magazine's growth over the years, addressing topics ranging from specific programming languages to graphics and animation, hardware, and finance. Softalk seemed to eschew the elitism and exclusivity that characterized technical discourse in other publications. As a February 1981 letter writer commented, "For the first time, someone explains assembler programming without presupposing the reader had already designed and constructed a one megabyte mainframe. No meetings to attend and no secret handshakes to remember."⁴³ While the author is clearly familiar with programming (evidenced by the fact that they are trying to learn assembly language), they do not relate to the insular insider speech that might be associated with hardcore enthusiasts or technical professionals.

Yet even as *Softalk* was building out a slate of beginner programming tutorials, letters about programming were declining in proportion to other topics; during the magazine's final two volumes, from September 1982 to August 1984, letters referencing programming dropped from approximately one-third to one-tenth of Open Discussion. This drop in programming commentary was never addressed in the magazine itself and surely derives from interknit factors.⁴⁴ For example, it is plausible that some hardcore enthusiasts took their conversations to more technical magazines; that amateur programmers were gaining enough ground that they did not feel the need to write in; and that other resources were improving, be it publisher or retailer support, better documentation, or the rise of more accessible beginner guides (advertisements for books, catalogs, and tutorial products more than doubled in *Softalk* between the magazine's founding and late 1982). But we also know that *Softalk*'s circulation was expanding and that expansion likely had one primary direction: beyond the hobbyists who had formed the molten center of early microcomputer adoption in the late 1970s and toward tech-curious beginners. We also know from the analysis of letter types that Open Discussion's primary role did not change—it

continued to be a site for requesting help, providing tips, making announcements, and commenting on the industry. Thus, while the drop in programming letters may have been impacted by various externalities, it also appears to follow from a shift in what the growing constituency of Apple II consumers were doing with their micros, namely, exploring *products* rather than *programming*.

This trend is evidenced by a boom of new topics that emerged in Open Discussion beginning around the time of its second volume; from this point on, no one topic comes to dominate the way programming-related letters had once commanded the pages of *Softalk* (figure 12).⁴⁵ Rather, topics splinter into a range of smaller subconversations as programming is slowly displaced by letters concerning computer products, services, and applications such as databases, genealogy, BBSs, and gaming beginning in late 1981. For example, in the June 1982 issue alone, topics ranged across a representative array of product-oriented inquiries:

For many years I have been keeping track of my monthly bills in a small ledger. I eventually wanted to use the Apple for this purpose, but didn't want to take the time to write the program. (George L. Cox Jr., Colorado Springs, CO)

I would appreciate hearing from anyone who utilizes the Apple for *any* food or diet program, *especially* diabetic programs; and also for recipe storage, or *any* kitchen related program. (Mrs. Ray Gada Jr., Modesto, CA)

I just received the April issue of *Softalk* and wanted to relay to you a compliment of the fine article with the explanation of the *Dow Jones Market Analyser* program. I was able to see a demonstration of this new program at an investment seminar on its introduction and agree with you that it is an excellent "value" package. (Merle Zmak, Clayton, CA)

I wrote a letter to Personal Software Inc., now VisiCorp. I have as yet not received my replacement disks, the delay was unnecessary as noted in my second letter. VisiCorp did not really answer any of my questions nor offer any assistance with my problems except that the Visi-File program will not support a multi-disk file. (George L. Smith, Austin, TX)

As a whole, these letters typically focused on the benefits or limitations of specific software, suggesting *Softalk* letter writers were using and looking for recommendations for software they could buy rather than develop themselves. In the last two volumes of *Softalk*, numerous letters also addressed a growing interest in desktop publishing; more than 18 percent of the letters in volumes 3 and 4 mentioned printers or word processing.

From late 1982 and throughout 1983, the formation and growth of a new "user" identity, distinct from the hobbyist or hacker, explain the intensity of the shift from *programming* to *products* in the letters published by *Softalk*. This transition from programming to products as the center of the microcomputing experience finds rare exemplification in a November 1982 letter from Tod Wicks of Palo Alto, California, in which he begins by introducing his own history with his Apple II: "I bought my Apple over three years ago as a new toy. I didn't know a thing about hard, soft, and firmware. Learning Finnish was



FIGURE 12. Relative proportions of major themes in Open Discussion, six-month samples, 1980–84.

easier than learning assembly language. The hobby soon turned into a small (micro) business, and instead of learning how to program, I bought programs to use. I became a *userhobbyist*."⁴⁶ For Wicks, *being a user is a hobby* on the basis that he enjoys computerizing everyday tasks, such as managing his local Mensa group mailing list (the remainder of the letter extensively discusses his experience using *Mail List Database* from Synergistic Systems). Readers like Wicks represented a new "hobbyist" identity uncoupled from assembly language arcana and soldering irons. Much as earlier hobbyists enjoyed mastering the internals of the Apple II, user-hobbyists like Wicks took pleasure in the expert application of microcomputing to everyday life.

Unlike enthusiasts of the late 1970s, who took up microcomputing out of an inherent fascination with the technology itself, users of the early 1980s came to computer ownership expecting to perform the sorts of tasks marketed by the Apple Corporation, as well as the third-party industries that followed in its wake: managing home finances, running a small business, playing games, running educational software, and so on. This vision of applied microcomputing played out against a backdrop of popular media and industrial development, spurring excitement for personal computers. A flood of speculative investment prompted in part by changes to the capital gains tax in 1978 and 1981 catalyzed a boom in consumer software and hardware products visible in the advertisements printed in Softalk.⁴⁷ The launch of the IBM Personal Computer, released on August 12, 1981, brought an aura of legitimacy to this immature, chaotic industry, buoying the confidence of both investors and consumers. The publication of *Time* magazine's "Machine of the Year" cover story in January 1983 exposed millions of everyday consumers to the notion of the microcomputer as an accessible technology for American families and small businesses. And by the time WarGames debuted in US theaters in June 1983, the microcomputer was widely recognized as a powerful symbol of American progress, an escape from deindustrialization, and a hope for the future.⁴⁸ The proliferation of new topics in Open Discussion reflected this rapid spread of computing across the country's commercial, political, and cultural landscapes. While the hype drove many Americans to become first-time computer owners, the letters published in *Softalk* document their difficult transformation into users.

CONCLUSION

I have been a salesperson in a retail electronics store for more than four years, during which time the personal computer industry has changed from an esoteric, expensive, hobbyist type of market to one in which it seems everyone is interested.

-Phil Jurgenson, Mankato, MN, letter to Open Discussion, Softalk, August 1984

August 1984 was *Softalk*'s LAST ISSUE. THERE WAS NO GREAT ANNOUNCEMENT OR SINCERE editorial—just a September issue that never came. While subscribers were likely confused, it is just as likely that no one in the industry itself would have been surprised. Since roughly late 1983, the microcomputer software industry had been in the grip of a shakeout.⁴⁹ In a short stretch of time, projections of microcomputer hardware sales had outstripped demand—in no small part because microcomputing so rarely made good on the promises made by pundits, futurists, and feverish marketers. The market was bloated with too many systems and too much software, perplexing the very user base it was supposed to be attracting. As companies dried up and sold off their inventories in a desperate attempt to mitigate losses, advertising dollars dried up as well; new ads were not purchased, and overdue bills were never paid. One day Comstock and Tommervik simply realized they could not afford to print another issue.

The letters published in *Softalk* offer a unique view into an understudied period in the history of computing. It has become an article of faith in academic computer history that "historians have yet to document the general history of personal computing."⁵⁰ Backlit by nostalgia and dominated by an innovator class merely looking to affirm their own memory, the history of personal computing has largely been left to the realm of first-person memoir and industry studies. As a result, outlier individuals and organizations such as Bill Gates and the Homebrew Computer Club stand in for the much more diverse population of first-time computer owners visible in the pages of *Softalk*. By accepting the narratives of elites and industry representatives, we lose the meaningful distinctions among such lived identities as "hobbyist," "hacker," "expert," and "user."

Softalk attracted the widest possible gamut of Apple II owners, and the diversity of use reveals itself almost immediately within their letters. The stories of readers struggling to complete seemingly simple tasks challenge any notion that Americans easily or instinctively took to microcomputers following the release of "out-of-the-box" machines like the Apple II, the TRS-80, and the Commodore PET. Instead, the situated needs of letter writers expose the varied historical conditions of what Joy Lisi Rankin terms "acts of computing," lived experiences with computers almost wholly unrelated to the technical specifications or commercial success of one or another machine.⁵¹

The trend toward a discussion of products and services in *Softalk*'s letters depicts a dramatic shift in the orientation of Apple II use—a shift that was undoubtedly mirrored across other microcomputer platforms. In aggregate, these letters form an intricate timeline of user ambitions, imaginings, frustrations, and disappointments relative to the discrete changes in the market. Homebrewers and hobbyists did not disappear with the popularization of the PC, but they did have to find a new place and new identity alongside a wider and less technically sophisticated constituency of users and consumers prized by the burgeoning software industry. As computerization spread into the domestic and professional spheres during the 1980s, new forms of expertise emerged. The pleasure of technical mastery that hobbyists once found in learning microprocessor instructions and wiring RAM boards was now available in the application of microcomputers to tasks within home and workplace. In the place of programming languages, a new population of computer users became experts in swapping games, troubleshooting printers, and debugging spreadsheets.

APPENDIX

The GOAL OF ANALYZING THE LETTERS PUBLISHED IN OPEN DISCUSSION WAS TO ESTIMATE THE overall demographics, interests, concerns, and motivations of *Softalk* readers. The content analysis procedure included a mix of descriptive and interpretative coding tasks. To develop our codebook, we began by independently reading the first volume of *Softalk*, from September 1980 to August 1981. This period included 127 letters from 123 readers. Based on the content of this preliminary sample, we generated a list of forty-nine categorical variables. Not mutually exclusive, these categories represented a wide range of descriptive and thematic material, including reader interests, identities, technical expertise, professional experience, and areas of debate. To test the validity of these categories, we recoded the preliminary sample. After adjusting the codebook based on this second round of testing, we proceeded to code the remaining three volumes of the magazine.

For each letter, we recorded the author's name, title, affiliation, and location. After reading the text, we selected descriptive and thematic categories from a list and typed out any additional themes in an open response field. We also noted if a *Softalk* editor responded to the letter writer in print or if the letter referred to a previously published letter or article. Based on the published name and any details in the text, we classified each writer's gender as female, male, or an open response. While this method offered only a limited account of gender, it nevertheless provided a general sense of how *Softalk* readers might have interpreted the gender identities of their fellow computer owners in Open Discussion. In the absence of additional evidence as to the gender of a letter's author, all letters signed with a first initial were coded "unknown." Lastly, we compared our inferred gender categories to the automated judgment of a gender classifier program and manually rechecked all of the cases in which the software output disagreed with our human judgment (approximately 5 percent).⁵²

After analyzing all of the letters, we ran a set of custom programs to clean the textual output from the coding form, generate latitude and longitude from the location metadata, and check for duplicate entries.⁵³ As a rule, *Softalk*'s editors printed the city and state after the name of the author (presumably based on the postmark or return address); for entries with missing or incomplete location information, we attempted to infer location from the letter's content. We were able to identify a city or town for all but twelve of the letters (>99 percent of the corpus). To preserve the privacy of individual authors, we restricted the precision of the location search to the city or town. To identify repeat authors, we calculated the Levenshtein distance between all pairs of names and locations.⁵⁴ Near matches were verified by hand. Only a small number of authors (approximately 7 percent) published more than one letter.

The content analysis resulted in a set of annotations regarding the population of letter writers, the content of their letters, and, to a limited extent, their reception in the pages of *Softalk*. We generated cross tabulations to locate letters matching specific criteria (e.g., letters from the Midwest written by women about programming), as well as to track the rise and fall of various discussions and debates over the lifetime of the magazine.

NOTES

We would like to express our profound gratitude and appreciation to Jim Salmons and Timlynn Babitsky for their support, good will, humor, and vision. Learn more about their work on the Softalk Apple Project at http://www.softalkapple.com.

1. Margot Comstock Tommervik, Straightalk, Softalk, September 1980, 3.

2. The term "microcomputer" encompassed both "personal computer" and "home computer," as the latter terms referred to different buyers' markets and lines of hardware during the late 1970s through the early to mid-1980s. Generally speaking, "personal computers" were computers intended for businesses. "Home computers" were machines that ranged from "general-purpose" use (Commodore PET or Apple II) to extremely inexpensive gaming or calculation machines (Commodore 64, Coleco ADAM, or Mattel Aquarius). Yet the highest-end home computers, such as the Apple II, might also find themselves used as a business machine. Users, dealers, and hardware and software manufacturers brought tremendous sensitivity to these distinctions. For primary document references, see Edward J. Coburn, "Understanding Where Microcomputers Came From and Where They Are Now," in *Learning about Microcomputers: Hardware and Applications Software* (Albany, NY: Delmar, 1986), 1–41; Jerry Willis and Merl Miller, *Computers for Everybody: 1984 Buyer's Guide* (Beaverton, OR: Dilithium Press, 1984).

3. For works on the origins of and influences upon early microcomputing hobbyists, see Kristen Haring, *Ham Radio's Technical Culture* (Cambridge, MA: MIT Press, 2008); Elizabeth Petrick, "Imagining the Personal Computer: Conceptualizations of the Homebrew Computer Club 1975–1977," *IEEE Annals of the History of Computing* 39, no. 4 (2017): 27–39; Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago: University of Chicago Press, 2006).

4. Fred D'Ignazio, "How to Get Intimate with Your Computer: Part One," *Compute!*, November 1983, 154.

5. The Apple Macintosh, released in 1984, is commonly regarded as the first mainstream personal computer with a graphical user interface. Prior to this, the Xerox Star (1981), the PERQ workstation (1979), and the Apple Lisa (1983) had GUIs, though all were high-end business systems with limited exposure to general consumers.

6. Lee Bandle, letter to Open Discussion, *Softalk*, August 1981.

7. Kevin Gotkin, "When Computers Were Amateur," *IEEE Annals of the History of Computing* 36, no. 2 (2014): 4–14; Petrick, "Imagining"; Dejan Ristanović and Jelica Protić, "Once Upon a Pocket: Programmable Calculators from the Late 1970s and Early 1980s and the Social Networks around Them," *IEEE Annals of the History of Computing* 34, no. 3 (2012): 55–56; Zbigniew Stachniak, "Red Clones: Soviet Computer Hobby Movement of the 1980s," *IEEE Annals of the History of Computing* 37, no. 1 (2015): 12–23; Jaroslav Švelch, "Say It with a Computer Game: Hobby Computer Culture and the Non-entertainment Uses of Homebrew Games in the 1980s Czechoslovakia," *Game Studies* 13, no. 2 (2013); Melanie Swalwell, "The Early Micro User: Games Writing, Hardware Hacking, and the Will to Mod," in *Proceedings of DiGRA Nordic* 2012 Conference: Local and Global—Games in Culture and Society, Tampere, Finland, June 6–8, 2012.

8. Martin Campbell-Kelly et al., *Computer: A History of the Information Machine*, 3rd ed. (Boulder, CO: Westview Press, 2014), 241.

9. Petrick, "Imagining," 37.

10. Eric C. Newburger, *Computer Use in the United States, October 1997, Current Population Reports*, prepared by the US Department of Commerce in cooperation with the US Census Bureau (Washington, DC, September 1999).

11. Paul Freiberger and Michael Swaine, "Retailing the Revolution," in *Fire in the Valley: The Making of the Personal Computer* (New York: McGraw-Hill, 1984), 157–79.

12. David P. Nord, *Communities of Journalism: A History of American Newspapers and Their Readers* (Champaign: University of Illinois Press, 2001), 247.

13. Bill Reader and Kevin Moist, "Letters as Indicators of Community Values: Two Case Studies of Alternative Magazines," *J&MC Quarterly* 85, no. 4 (2008): 827.

14. For work discussing and critiquing "the user" as a paradigm in media studies and the history of computing, see Thierry Bardini and August T. Horvath, "The Social Construction of the Personal Computer User," *Journal of Communication* 45, no. 3 (1995): 40–65; Leah A. Lievrouw and Sonia Livingstone, introduction to *New Media: Sage Benchmarks in Communication*, ed. Leah A. Lievrouw and Sonia Livingstone (London: Sage, 2009), 9; Joy Rankin, *A People's History of Computing in the United States* (Cambridge, MA: Harvard University Press, 2018), 5.

15. Everett M. Rogers, *Diffusion of Innovations*, 5th ed. (New York: Free Press, 2003), 281–83. **16.** Rankin, *A People's History*, 2.

17. Platform-specific magazines were common beginning in the late 1970s. Other Apple-specific magazines from the era include *InCider*, *Nibble*, *Peelings II*, and *Call-A.P.P.L.E*.

18. For more detail on the lives of Margot Comstock Tommervik (who now goes by just Margot Comstock) and Al Tommervik, see Doug Carlston, *Software People: An Insider's Look at the Personal Computer Software Industry* (New York: Simon & Schuster, 1985), 168–74; Steven Levy, *Hackers: Heroes of the Computer Revolution* (1994; New York: Penguin, 2001), 308–10, 388–89. Two different video interviews with Margot Comstock, from 1987 and 2015, are available at the Smithsonian and on the Internet Archive, respectively: "Smithsonian Video-history Program, Minicomputers and Microcomputers, Session One, the Brotherhood," by Jon B. Eklund, Smithsonian Institution Archives, July 31, 1987, Record Unit 9533; "Interview with Margot Comstock, Co-founder and Editor, *Softalk* Magazine," by Jason Scott, *Internet Archive*, June 20, 2015, https://archive.org/details/2015 06 Margot Comstock Interview.

19. Efrem Sigel and Louis Giglio, *Guide to Software Publishing: An Industry Emerges* (White Plains, NY: Knowledge Industry Publications, Inc., 1984), 18.

20. "Sign Up for Softalk," *Softalk*, September 1980, 2. *Softalk* transitioned its distribution policy in January 1982, limiting a free subscription to one year's length for Apple owners.

21. "Softalk Changes Its Distribution Policy," *Softalk*, January 1982, 9; "Computing," *Folio* 400 (New Canaan, CT: Folio Publishing Company, 1984), 181. While *Softalk* estimated 60,000 subscribers in January 1982, the *Folio* 400 detailed that *Softalk*'s average subscription circulation was 51,835 in 1983. Explanations for this difference in number could be that *Softalk* was counting batch shipments to computer stores and newsstands as part of their "subscriber list"; errors in record-keeping; differences in calculating free versus paid subscriptions; or an actual drop in subscribers (which seems unlikely). The calculation that *Softalk*'s circulation equaled approximately one-tenth of all Apple owners is based on the calculation that Apple had an installed base of 1,188,000 units in 1983 (equal to 44 percent of an installed base shared between Apple, Tandy, and IBM, 2.7 million units total). See Sigel and Giglio, "Guide to Software Publishing," 18.

22. "Computing," Folio 400, 181.

23. "Softalk Changes Its Distribution Policy," *Softalk*, January 1982, 8; Tommervik, Straightalk, *Softalk*, September 1980, 3.

24. Carlston, Software People, 170–72.

26. Softalk, October 1980, 5.

27. Ibid.

28. This article would not be possible without the support of the Softalk Apple Project (STAP), founded in 2013 by Jim Salmons and Timlynn Babitsky. At the time this project began, *Softalk* was not yet available on the Internet Archive, making the access STAP offered truly critical. Previously, Salmons worked as both the director of marketing and a freelance contributor to *Softalk*. The Softalk Apple Project is dedicated to extending the legacy of *Softalk* by using the archived magazine as a proving ground for computational techniques in organizing and analyzing human knowledge. In this respect, the STAP offers a provocative model of engaging with the past on its own terms. See http://softalkapple.com/.

29. The linear correlation between pages and letters per issue of *Softalk* is strongly positive, Pearson's coefficient for the population rho = 0.77.

30. Many prominent journalistic and enthusiast histories document only or almost exclusively men, with women functioning as rare exceptions. See Robert X. Cringely, *Accidental Empires: How the Boys of Silicon Valley Make Their Millions, Battle Foreign Competition, and Still Can't Get a Date* (New York: HarperBusiness, 1996); Freiberger and Swaine, *Fire in the Valley*; Walter Isaacson, *The Innovators: How a Group of Hackers, Geniuses, and Geeks Created the Digital Revolution* (New York: Simon and Schuster, 2014); Levy, *Hackers.* The gender bias in the telling of the history of computational media has been broadly documented and critiqued in both popular and academic writing. For significant academic examples, see Janet Abbate, *Recoding Gender: Women's Changing Participation in Computing* (Cambridge, MA: MIT Press, 2012); Marie Hicks, *Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing* (Cambridge, MA: MIT Press, 2017); Laine Nooney, "A Pedestal, a Table, a Love Letter: Archaeologies of Gender in Video Game History," *Game Studies* 13, no. 2 (2013).

31. We normalized the letter counts using 1984 state population estimates. This census table did not include Puerto Rico. "Intercensal Estimates of the Total Resident Population of States: 1980 to 1990," Population Estimates Branch, US Bureau of the Census, August 1996, https://www2.census.gov/programs-surveys/popest/tables/1980-1990/state/asrh/st8090ts.txt.

32. J. Barry Smith, letter to Open Discussion, Softalk, January 1982.

33. Apple did release the Apple Europlus II for the Western European market and the Apple II J-Plus in Japan, both in 1978. One Open Discussion letter, from April 1981, is from an owner living in Germany with a Europlus. However, in terms of *Softalk*'s content, the magazine did not address these systems.

34. Montgomery A. Lee, letter to Open Discussion, Softalk, March 1982.

35. The starting price for an Apple II was \$1,298, which included 4K. An Apple II with 48K RAM cost \$2,638. Neither price included a monitor or a cassette drive, which would have run an additional several hundred dollars. This is considerably more expensive than either the Commodore PET (\$595) or the TRS-80 (\$600), which were also comprehensive systems. The cost of an Apple II equaled approximately 10 percent of the median household income in the United States in 1983, which was \$20,885. *Money Income of Households, Families, and Persons in the United States: 1983*, Series P-60, No. 146, prepared by the US Department of Commerce in cooperation with the Bureau of the Census (Washington, DC, April 1985), 7.

^{25.} Ibid., 174.

36. Letters referenced as follows: Patricia L. Adler, letter to Open Discussion, *Softalk*, May 1982; Muriel S. Karlin, letter to Open Discussion, *Softalk*, August 1983; Gregory Kunz, letter to Open Discussion, *Softalk*, March 1981; Mark Gallagher, letter to Open Discussion, *Softalk*, November 1982.

37. Mike Carlson, letter to Open Discussion, *Softalk*, January 1983.

38. Approximately 8.2 percent of all letters included source code. While most of the magazine's content appeared in the classic Century serif typeface, the editors set in-line source code in a variant of sans serif Futura, making it stand out on the page and, presumably, easier to transcribe.

39. David Rabson, letter to Open Discussion, June 1983.

40. Jerry McGinn, letter to Open Discussion, *Softalk*, February 1981; Henry Getson, letter to Open Discussion, *Softalk*, January 1981; Claudine Moffat, letter to Open Discussion, *Softalk*, July 1981.

41. Art Christopher, letter to Open Discussion, Softalk, November 1981.

42. Editor Open Discussion response to Tom Spidell, *Softalk*, August 1981.

43. C. J. Armstrong, Open Discussion, Softalk, February 1981.

44. In September 1983 *Softalk* introduced a new column promising expert answers to technical questions. Fifty-two letters appeared in this column. While some may have otherwise been published in Open Discussion, their purpose was to solve a specific problem rather than cultivate community. We excluded these letters from our calculations.

45. To investigate this change in reader interests, we constructed a time series from six-month batches of Open Discussion letters. Using our labeled data, we counted the number of letters discussing each theme and normalized this count by the total number of letters published at each interval. Aligning these sequences revealed topical trends in the pages of Open Discussion. **46.** Tod Wicks, letter to Open Discussion, *Softalk*, November 1982, emphasis added.

47. Carlston, Software People, 191.

48. Stephanie Ricker Schulte, "The 'WarGames Scenario': Regulating Teenagers and Teenaged Technology," in *Cached: Decoding the Internet in Global Popular Culture* (New York: New York University Press, 2013), 21–54.

49. "The Shakeout in Software: It's Already Here," Businessweek, August 20, 1984, 102–4.

50. James W. Cortada, *IBM: The Rise and Fall and Reinvention of a Global Icon* (Cambridge, MA: MIT Press, 2019), 381. This sentiment is echoed in Campbell-Kelly et al., *Computer*, 229.
51. Rankin, *A People's History*, 11.

52. We used the open-source "gender-guesser" Python package as a second heuristic for inferring the genders of *Softalk* letter writers. In comparison to other gender-inference software, gender-guesser performs especially well on names of European origin, which include a majority of the authors published in *Softalk*. We did not use automated gender inference as a replacement for but rather as a complement to human judgment. See Israel Saeta Pérez, *Gender-Guesser: Get the Gender from First Name*, version 0.4.0, 2016, https://github.com/lead-ratings/gender-guesser/; Lucía Santamaría and Helena Mihaljević, "Comparison and Benchmark of Name-to-Gender Inference Services," *PeerJ Computer Science*, July 16, 2008, e156.

53. Source code for all custom scripts available from the authors by request. Geo-coding performed using the Microsoft Bing Maps API.

54. We used the open-source FuzzyWuzzy fuzzy string matching package to calculate the Levenshtein distances: https://chairnerd.seatgeek.com/fuzzywuzzy-fuzzy-string-matching-in -python.