ALSO BY SHERRY TURKLE

Psychoanalytic Politics

The Second Self

Life on the Screen

Evocative Objects (Ed.)

Falling for Science (Ed.)

The Inner History of Devices (Ed.)

Simulation and Its Discontents

alone together

Why We Expect More from Technology and Less from Each Other

Sherry Turkle

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TO REBECCA

My letter to you, with love

AUTHOR'S NOTE

turning points

Thirty years ago, when I joined the faculty at MIT to study computer culture, the world retained a certain innocence. Children played tic-tac-toe with their electronic toys, video game missiles took on invading asteroids, and "intelligent" programs could hold up their end of a serious chess match. The first home computers were being bought by people called hobbyists. The people who bought or built them experimented with programming, often making their own simple games. No one knew to what further uses home computers might be put. The intellectual buzz in the still-young field of artificial intelligence was over programs that could recognize simple shapes and manipulate blocks. AI scientists debated whether machines of the future would have their smarts programmed into them or whether intelligence might emerge from simple instructions written into machine hardware, just as neurobiologists currently imagine that intelligence and reflective self-consciousness emerge from the relatively simple architecture and activity of the human brain.

Now I was among them and, like any anthropologist, something of a stranger in a strange land. I had just spent several years in Paris studying how psychoanalytic ideas had spread into everyday life in France—how people were picking up and trying on this new language for thinking about the self. I had come to MIT because I sensed that something similar was happening with the language of computers. Computational metaphors, such as "debugging" and "programming,"

were starting to be used to think about politics, education, social life, and—most central to the analogy with psychoanalysis—about the self. While my computer science colleagues were immersed in getting computers to do ingenious things, I had other concerns. How were computers changing us as people? My colleagues often objected, insisting that computers were "just tools." But I was certain that the "just" in that sentence was deceiving. We are shaped by our tools. And now, the computer, a machine on the border of becoming a mind, was changing and shaping us.

As a psychoanalytically trained psychologist, I wanted to explore what I have called the "inner history of devices."[1] Discovering an inner history requires listening—and often not to the first story told. Much is learned from the tossed-off aside, the comment made when the interview is "officially" over. To do my work, I adopted an ethnographic and clinical style of research as I lived in worlds new to me. But instead of spending hundreds of hours in simple dwellings, as an anthropologist in a traditional setting would do, listening to the local lore, I lurked around computer science departments, home computer hobbyist clubs, and junior high school computer laboratories. I asked questions of scientists, home computer owners, and children, but mostly I listened to how they talked and watched how they behaved among their new "thinking" machines.

I heard computers provoke erudite conversations. Perhaps, people wondered, the human mind is just a programmed machine, much like a computer. Perhaps if the mind is a program, free will is an illusion. Most strikingly, these conversations occurred not just in seminar rooms. They were taking place around kitchen tables and in playrooms. Computers brought philosophy into everyday life; in particular, they turned children into philosophers. In the presence of their simple electronic games—games that played tic-tac-toe or challenged them in spelling—children asked if computers were alive, if they had different ways of thinking from people, and what, in the age of smart machines, was special about being a person.

In the late 1970s and early 1980s, I witnessed a moment when we were confronted with machines that invited us to think differently about *human* thought, memory, and understanding. The computer was an evocative object that provoked self-reflection. For me, this was captured in a conversation I had with thirteen-year-old Deborah in the early 1980s. After a year of studying programming, Deborah said that, when working with the computer, "there's a little piece of your mind and now it's a little piece of the computer's mind." Once this was achieved, you could see yourself "differently."[2] Face-to-"face" with a computer,

people reflected on who they were in the mirror of the machine. In 1984, thinking about Deborah (and in homage as well to Simone de Beauvoir), I called my first book on computers and people *The Second Self.*

That date, 1984, is of course iconic in Western intellectual thinking, tethered as it is to George Orwell's novel. *Nineteen Eighty-Four* describes a society that subjects people to constant government surveillance, public mind control, and loss of individual rights. I find it ironic that my own 1984 book, about the technology that in many a science fiction novel makes possible such a dystopian world, was by contrast full of hope and optimism. I had concerns about the "holding power" of the new technology: some people found computers so compelling that they did not want to be separated from them. And I worried whether losing oneself in worlds within the machine would distract us from facing our problems in the real—both personal and political. But, in this first work, I focused on how evocative computers fostered new reflection about the self.

In the decade following the publication of *The Second Self,* people's relationships with computers changed. Whereas in the 1980s that relationship was almost always one-on-one, a person alone with a machine, in the 1990s, this was no longer the case. By then, the computer had become a portal that enabled people to lead parallel lives in virtual worlds. People joined networks such as America Online and discovered a new sense of "place." These were heady times: we were no longer limited to handfuls of close friends and contacts. Now we could have hundreds, even thousands, a dazzling breadth of connection. My focus shifted from the one-on-one with a computer to the relationships people formed with each other using the computer as an intermediary.

I began throwing weekly pizza parties in the Boston area to meet people who could tell me the stories of their lives in the new virtual worlds. They described the erosion of boundaries between the real and virtual as they moved in and out of their lives on the screen. Views of self became less unitary, more protean. I again felt witness, through the prism of technology, to a shift in how we create and experience our own identities.

I reported on this work in my 1995 *Life on the Screen*, which offered, on balance, a positive view of new opportunities for exploring identity online. But by then, my optimism of 1984 had been challenged. I was meeting people, many people, who found online life more satisfying than what some derisively called "RL," that is, real life. Doug, a Midwestern college student, played four avatars, distributed across three different online worlds. He always had these worlds open as windows on his computer screen along with his schoolwork, e-mail program,

and favorite games. He cycled easily through them. He told me that RL "is just one more window." And, he added, "it's not usually my best one."[3] Where was this leading?

Two avenues forward became apparent by the mid-1990s. The first was the development of a fully networked life. Access to the network no longer required that we know our destination. With browsers and search engines—Mosaic, Netscape, Internet Explorer, Google—one had the sense of traversing an infinite landscape always there to be discovered. And as connections to the Internet went mobile, we no longer "logged on" from a desktop, tethered by cables to an object called a "computer." The network was with us, on us, all the time. So, we could be with each other all the time. Second, there was an evolution in robotics. Now, instead of simply taking on difficult or dangerous jobs for us, robots would try to be our friends. The fruits of such research made their way into children's playrooms: by the late 1990s, children were presented with digital "creatures" that made demands for attention and seemed to pay attention to them.

Alone Together picks up these two strands in the story of digital culture over the past fifteen years, with a focus on the young, those from five through their early twenties—"digital natives" growing up with cell phones and toys that ask for love. If, by the end of researching *Life on the Screen*, I was troubled about the costs of life with simulation, in the course of researching this book, my concerns have grown. These days, insecure in our relationships and anxious about intimacy, we look to technology for ways to be in relationships and protect ourselves from them at the same time. This can happen when one is finding one's way through a blizzard of text messages; it can happen when interacting with a robot. I feel witness for a third time to a turning point in our expectations of technology and ourselves. We bend to the inanimate with new solicitude. We fear the risks and disappointments of relationships with our fellow humans. We expect more from technology and less from each other.

In this book I concentrate on observations during the past fifteen years, but I also reach back to the prehistory of recent developments. To tell the story of artifacts that encourage relationship, I begin with the ELIZA program in the 1970s and take the story through to the "sociable" humanoid robots, such as Domo and Mertz, built at MIT in the 2000s. Along the way there have been many other digital "creatures," including Tamagotchis, Furbies, AIBOs, My Real Babies, Kismet, Cog, and Paros, these last, robot baby seals designed specifically to provide companionship for the elderly. I thank the more than 250 people involved in my robot studies. Some who met robots came to MIT; other times I

brought robots to schools, after-school centers, and nursing homes. When working with children, whenever possible, I provided them with a robot to take home for several weeks. Children and their families were asked to keep "robot diaries," accounts of home life with an AIBO, My Real Baby, or Furby.

In the story of computer-mediated communication, I began my investigations in the 1980s and early 1990s with e-mail, bulletin boards, Internet Relay Chat, and America Online and went on from there to the first virtual communities and multiuser online role-playing games. Over the past decade, as the network dramatically changed its contours, I broadened my investigation to include mobile devices, texts, instant messages, social networks, Twitter, and massively multiplayer online games. My work also included studies of virtual communities where three-dimensional avatars inhabit photorealistic spaces.

The focus of my research on networking was the young, and so I did most of my observations in high schools and on college campuses. But I also spoke with adults who gave me insight into how the network is changing parenting and communications patterns in fields from architecture to management consulting. Over 450 people have participated in my studies of connectivity, roughly 300 children and 150 adults. I thank everyone who lent their voices to this work over the past fifteen years. I am grateful for their generosity and good will.

The work reported on here, as all of my work, includes field research and clinical studies. In field research, one goes to where people and their technologies meet to observe interactions, sometimes ask questions, and take detailed notes. Depending on the nature of the field setting, casual conversations may take place over coffee or over snacks of milk and cookies. I teach courses about the computer culture and the psychology of computation, and some of my material comes from the give-and-take of the classroom. In the clinical component of my work, I pursue more detailed interviews, usually in an office or other quiet setting. I call these studies clinical, but of course my role in them is as a researcher, not a therapist. My interest in the "inner history" of technology means that I try to bring together the sensibility of ethnographer and clinician in all my work. A sensitive ethnographer is always open to the slip, to a tear, to an unexpected association. I think of the product as an intimate ethnography.

In my studies of robots, I provided the artifacts (from primitive Tamagotchis and Furbies to sophisticated robots such as Kismet and Cog). This meant that I was able to study children and seniors from a range of social and economic backgrounds. In the research on the networked life, I did not distribute any technology. I spoke to children, adolescents, and adults who already had Web

access and mobile phones. Necessarily, my claims about new connectivity devices and the self apply to those who can afford such things. This turned out to be a larger group than I had originally supposed. For example, in a public high school study in the spring of 2008, every student, across a wide range of economic and cultural situations, had a mobile phone that could support texting. Most students had phones that could put them on the Web. I am studying a moving target. In January 2010, a Nielson study reported that the average teen sends over three thousand text messages a month.[4] My data suggests that this number is steadily increasing. What I report here is nothing less than the future unfolding.*

My investigations continue. These days, parents wait in line to buy their children interactive Zhu Zhu robotic pet hamsters, advertised as "living to feel the love." And one of the hottest online programs is Chatroulette, with 1.5 million users, which randomly connects you to other users all over the world. You see each other on live video. You can talk or write notes. People mostly hit "next" after about two seconds to bring another person up on their screens. It seems right that Zhu Zhu pets and Chatroulette are the final "objects" I report on in this book: the Zhu Zhus are designed to be loved; in Chatroulette, people are objectified and quickly discarded. I leave my story at a point of disturbing symmetry: we seem determined to give human qualities to objects and content to treat each other as things.

I preserve my subjects' anonymity by changing identifying details, except where I cite scientists and researchers on the public record or those who have asked to be cited by name. Without mentioning "real" names and places, I express appreciation to everyone who has spoken with me and to the school directors and principals, teachers, and nursing home directors and staff who made my work possible. I studied robots in two nursing homes and have data from students in seven high schools (two public and coeducational; five private, one for girls, two for boys, one coeducational; and one coeducational Catholic high school). In some cases I have been able to follow children who grew up with Tamagotchis and Furbies through their adolescence and young adulthood as they entered the networked culture to become fluent with texting, Twitter,

* In this book I use the terms *the Net*, *the network*, and *connectivity* to refer to our new world of online connections—from the experience of surfing the Web, to e-mail, texting, gaming, and social networking. And I use the term *cell phone* to describe a range of connectivity devices such as BlackBerries and iPhones that do a lot more than make "calls." They provide access to instant messaging, texting, e-mail, and the Web.

MySpace, Facebook, and the world of iPhone apps. I thank these young adults for their patience with me and this project.

I did much of the work reported here under the auspices of the MIT Initiative on Technology and Self. I thank all of my colleagues and students who worked with the initiative and in the Program for Science, Technology, and Society, which is its academic home. I have profited from their support and good ideas.

Collegial relationships across MIT have enriched my thinking and been sources of much appreciated practical assistance. Rodney Brooks provided me with an office at the MIT Artificial Intelligence Laboratory to help me get the lay of the land. He gave me the best possible start. Cynthia Breazeal and Brian Scassellati, the principal developers of Kismet and Cog, worked with me on the first-encounters study that introduced sixty children to these robots. These two generous colleagues helped me to think through so many of the issues in this book. On this study, I worked with research assistants Anita Say Chan, Rebecca Hurwitz, and Tamara Knutsen, and later with Robert Briscoe and Olivia Dasté. The Kismet and Cog support team, including Lijin Aryananda, Aaron Edsinger, Paul Fitzpatrick, Matthew Marjanavic, and Paulina Varchavskaia, provided much needed assistance. At the very beginning of my research on virtual worlds, I worked with Amy Bruckman. For me, it was a touchstone collaboration. Jennifer Audley, Joanna Barnes, Robert Briscoe, Olivia Dasté, Alice Driscoll, Cory Kidd, Anne Pollack, Rachel Prentice, Jocelyn Scheirer, T.L. Taylor, and William Taggart all made precious contributions during the years of interviews with children, families, and elders. I worked with Federico Castelegno at MIT on a study of online gaming; I thank him for his insights.

In this diverse and talented group, four colleagues deserve special recognition: Jennifer Audley worked on this project from the earliest studies of Tamagotchis and Furbies through the work on the robots Kismet and Cog. Olivia Dasté joined the project in 2001, working closely with me in nursing homes and schools and on the analysis of the "first encounters" of Kismet and Cog. William Taggart and Cory Kidd worked in nursing homes, primarily with the Paro robot. Each of them has my deepest thanks.

I also am grateful to Professors Caroline Jones, Seymour Papert, Mitchel Resnick, William Mitchell, Rosalind Picard, and William Porter. Conversations with each of them brought new ideas. For my thinking about Domo and Mertz, thanks to Pia Lindman, Aaron Edsinger, and Lijin Aryananda of MIT's Computer Science and Artificial Intelligence Laboratory (the Artificial Intelligence Laboratory's successor) who shared their experiences and their robots with me.

Conversations with five psychoanalytic colleagues were particularly important in shaping my thinking on children and the culture of simulation, both online and robotic: Dr. Ellen Dolnansky, Dr. James Frosch, Dr. Monica Horovitz, Dr. David Mann, and Dr. Patrick Miller.

My MIT colleague Hal Abelson sent me an e-mail in 1997, suggesting that I "study those dolls," and I always take his advice. In the late 1970s, he was the first to introduce me to the special hopes of personal computer owners who were not content until they understood the "innards" of their machines. In the late 1980s, he introduced me to the first generation of virtual communities, known at the time as "MUDs." Following his leads has always led me to my life's work. I can only repay my debt to Hal Abelson by following up on his wonderful tips. I thank him and hope I have done him proud.

Colleagues at Harvard and presentations at that institution have consistently broadened my perspective. In particular I thank Professors Homi Baba, Mario Biagioli, Svetlana Bohm, Vanessa Conley, Peter Galison, Howard Gardner, Sheila Jasonoff, Nancy Rosenblum, Michael Sandel, and Susan Sulieman for individual conversations and opportunities to meet with groups.

There are other debts: Thad Kull tirelessly tracked down sources. Ada Brustein, William Friedberg, Katie Hafner, Roger Lewin, David McIntosh, Katinka Matson, Margaret Morris, Clifford Nass, Susan Pollak, Ellen Poss, Catherine Rea, and Meredith Traquina gave excellent advice at key moments. Jill Ker Conway's reading of my first full draft provided encouragement and direction. Thomas Kelleher at Basic Books contributed organizational ideas and a much-appreciated line editing; Jennifer Kelland Fagan copyedited this manuscript with great care. Any infelicities of language are surely the result of my not taking their good advice. Grace Costa and Judith Spitzer provided the administrative support that freed my time so I could interview, think, and write.

I have worked with Kelly Gray on six book projects. In each one, her dedication, intelligence, and love of language have been sustaining. In *Alone Together*, whose primary data spans thirty years of life in the computer culture, it was Kelly who helped me find the narrative for the book I wanted to write. Additionally, some of my favorite turns of phrase in this book are ones that Kelly introduced into our many conversations. I wanted to list them; she told me not to, but her modesty should not deceive my readers about her profound contribution.

My work on robotics has been funded by the Intel Corporation, the Mitchell Kapor Foundation, the Kurzweil Foundation, and the National Science Foundation (NSF Grant # SES-0115668, "Relational Artifacts"). Takanori Shibata, the inventor of Paro, provided me with the baby seal robots to use in my studies. The Sony Corporation donated one of their very first AIBOs. My work on adolescents has been funded by the Intel Corporation, the Mitchell Kapor Foundation, and the Spencer Foundation. Among all this generosity, the contribution of Mitchell Kapor must be singled out. He understood what I was trying to accomplish with an Initiative on Technology and Self and gave it his full support. In all cases, the findings and opinions expressed here are mine and do not reflect the positions of the organizations and individuals who have helped me.

I have worked on the themes of this book for decades. It is certain that I have many unacknowledged debts. I take this opportunity to say thank you.

There is a final debt to my daughter Rebecca. Since she was six, she has patiently made friends with the talkative robots—simple and fancy—that I have brought into our home. I have asked her to take care of Tamagotchis, to play with Kismet and Cog, to befriend our own stay-at-home Paro. The My Real Babies frightened her, but she made a good effort to tell me why. Rebecca calls our basement storage room "the robot cemetery" and doesn't much like to go down there. I thank Rebecca for her forbearance, for her insightful and decisive editorial support, and for giving me permission to quote her. She refused to friend me on Facebook, but she taught me how to text. The story of digital culture has been the story of Rebecca's life. The book is written as a letter to her about how her mother sees the conversations in her future.

Now Rebecca is nineteen, and I know that, out of love for me, she is glad this book is finished. As for me, I'm not so sure. Thinking about robots, as I argue in these pages, is a way of thinking about the essence of personhood. Thinking about connectivity is a way to think about what we mean to each other. This book project is over; my preoccupation with its themes stays with me.

Sherry Turkle
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NOTES

AUTHOR'S NOTE: TURNING POINTS

1. Sherry Turkle, "Inner History," in Sherry Turkle, ed., *The Inner History of Devices* (Cambridge, MA: MIT Press, 2008), 2–29.

2. Sherry Turkle, *The Second Self: Computers and the Human Spirit* (1984; Cambridge, MA: MIT Press, 2005), 2.

3. Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon and Schuster, 1995), 13.

4. Roger Entner, "Under-aged Texting: Usage and Actual Cost," Nielsen.com, January 27, 2010, http://blog.nielsen.com/nielsenwire/online_mobile/under-aged-texting-usage-and-actual-cost (accessed May 30, 2010).

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2. Benedict Carey and John Markoff, "Students, Meet Your New Teacher, Mr. Robot," *New York Times*, July 10, 2010, www.nytimes.com/2010/07/11/science/11robots.html (accessed July 10, 2010); Anne Tergeson and Miho Inada, "It's Not a Stuffed Animal, It's a $6,000 Medical Device," *Wall Street Journal*, June 21, 2010, http://online.wsj.com/article/SB10001424052748704463504575301051844937276.html (accessed August 10, 2010); Jonathan Fildes, "'Virtual Human' Milo Comes Out to Play at TED in Oxford," *BBC News*, July 13, 2010, www.bbc.co.uk/news/10623423 (accessed July 13, 2010); Amy Harmon, "A Soft Spot for Circuitry: Robot Machines as Companions," *New York Times*, July 4, 2010, www.nytimes.com/2010/07/05/science/05robot.html?pagewanted=all (accessed July 4, 2010); Emily Veach, "A Robot That Helps You Diet," *Wall Street Journal*, July 20, 2010, http://online.wsj.com/article/SB10001424052748704682604575369981478383568.html (accessed July 20, 2010).