

Preface

It would be extremely difficult to think of any segment of human behavior that is not influenced by technology, be it classroom learning, the gospel that is presented over the microphone in the background of soothing lights in the church, or while packing for a vacation and making sure that the iPhone and/or computer has been packed and is fully charged. And yet, as we peruse through currently available textbooks of psychology, it is apparent that the effects of technology on human behavior have received scant attention. We were disappointed to notice that even books on social psychology, and more importantly, those on applied social psychology, have failed to pay due attention to the multifarious ways in which human behavior has been affected by a wide variety of technological interventions in every field of life and work.

Historically speaking, we can see that the study of behavior with reference to technology has found some place in certain subfields of psychology. Having its roots in applied experimental psychology, the phenomenon of behavior in the context of technology has been addressed by several subfields which, in turn, led not only to the expansion of the scope of psychology but also to the growth of psychology as a science. What immediately comes to mind are the areas of industrial psychology, organizational psychology, human performance, human factors engineering, and ergonomics. Because of the exponential growth in technology, the last 50 years has seen human behavior expanding to levels hitherto unthought-of and reaching vistas which are not only new but also much beyond the canvas of normal evolutionary changes in behavior. Despite such overarching effects of technology, has psychology as a science attempted to analyze its impact? We have reached the juncture where it has become imperative to develop a relatively nascent subfield of psychology, namely psychology of technology, and to delineate its scope and content as a comprehensive and independent subfield of psychology, with biology on one side and technology on the other. We anticipate that psychology of technology, perched, as it would be, between the symbiosis of biology and technology would then enrich our understanding of behavior in general and human cognition and emotion in particular. Psychology, as a science, will have a very special role to play, albeit it may sometimes lead to situations wherein such roles of psychology

could be undermined by other disciplines. As psychologists, it would then become even more crucial to make attempts to disentangle behavior and its biological substrates from the throes of technology.

Predicting what technology would do to us or what would be its future has never been easy. From Galileo and Edison to Martin Cooper, and, from Hubble to Hawking and to the many other famous contributors to technology, they have all been great innovators and thinkers. However, have they been able to predict the effects of technology in advance? For example, Edison doubted the use of the AC current and Martin Cooper concluded that cellular phones would never replace wire systems of telephony. As we look back to the times when the first generation of computers was introduced, were we able to comprehend what it and the World Wide Web would do to us? Did many professors who started teaching in the 1960s have any inclination of how technological developments would change their teaching methods through the use of Internet and PowerPoint presentations? Even the National Science Foundation has been skeptical, being able to foresee the effects of technology on humanity for a time slot of not more than 20 years (Roco & Bainbridge, 2002). To what extent will we remain human? Will we become a cyborg? What about man as a social animal? What about the limits to our vision and audition and even our ability to think, to solve problems—in fact, to cognize? These and many such questions continue to plague us, making them even fiercer, in the face of technology, which is becoming not only omnipresent but also almost omnipotent. And, in our daily lives the effect of technology has become so integral that we tend to forget information because it is readily available on the Internet or loaded in our iPhone (popularly known as the Google Effect or digital amnesia).

Simply put, it is often not easy to grasp the gap between the creation of a technological product and its use in our daily life. If you have tried to assemble “Do It Yourself (DIY)” kits after reading the instructions given by the engineers, you would be well aware of the frustrations. In other words, there is a big gap between the creation of a thing and its use, between the features of a gadget and its applications.

The above uncertainty about the effects of technology also calls for an understanding of its impact in the building of relationships, a core topic of study among social scientists. Many scholars have raised doubts about how technology will help in connecting people to each other. Robin Dunbar, a prominent evolutionary psychologist and author of *How many friends does one need* (Harvard University Press, 2010), is skeptical about the peaceful interactions of humans in the context of meeting new people during the course of evolution. As per Robin Dunbar’s calculation, our neocortex sets a limit for personalized relationships with not more than 150 people. Can technology change this course? Can we afford to play with the course of evolution? With technology moving at a pace faster than our capacity to adapt to it, we have already begun to have fears regarding our own creations, say, robots. Will man remain master of his creations or will he become a slave to them? Human beings have always been fascinated by the special abilities of other living beings, for example, the capacity of birds to fly, and this has led to the use of human intellect to acquire such skills through artifacts. With the complexity of such cre-

ations growing considerably, would such artifacts begin to control us? A movie, based on Pierre Boulle's novel, *In the planet of apes* (translated from the French, *La planete des singes*, published by "Le cercle du nouveau livre," 1963) focuses on what would have happened if the other creatures on earth had intelligence similar to that of human beings? Given our understanding of the survival of the human being through the forces of evolution, the answer to the above, in all likelihood, would be pessimistic, namely that "chaos" will reign for the simple reason that the peaceful coexistence of human beings with other living beings has been questionable throughout the history of mankind. That raises another question: is intelligence (or too much of it) a good thing? We might argue that the above novel and movie were mere fiction based on the imagination of the writer, Pierre Boulle, but with robots around, smarter than us and outsizing us in our biological abilities to process information, are we heading for "chaos" in the real sense? We can only guess that if a situation akin to that of Boulle's fiction does occur, the answers would be provided through co-evolution as a result of and through technology, although the issues of peaceful coexistence might well lead to connotations, different from what we have been used to in the past.

At the outset, we want to let the readers know that this book has been written with its own inherent limitations. First, take a look at the human brain which is the source of all creativity including that leading to the growth of technology. Technology, which originated outside our bodies, is gradually, but surely, becoming a part of ourselves and our bodies. A technologically modified and augmented cognition with its ever increasing capacity to handle and store information, erupting emotions in relations to artifacts such as "my robot is my friend," and the functioning of our two limbs—one of which may be natural and the other artificial—truly give many of us a sense of being an extension much beyond our biological inheritance. Second, borrowing and integrating knowledge from such diverse fields as technology and biology has not been easy and this book has attempted, in a straightforward and simplified form, to illustrate how the two disciplines converge together, to enrich the subfield of psychology of technology. And, as we cruise along through the growth of this field, we foresee its future course, with its interdisciplinary nature being its major strength, and contributions from sister social science disciplines, such as sociology, anthropology, economics, and many more, leading to its robust development.

While surveying the courses offered in psychology programs by universities around the globe, it became clear that there are not many which offer a course on this burgeoning field of psychology of technology. There may be several reasons for this. A primary need while designing and offering a course, as we have learnt from instructors across a wide range of disciplines, is the availability of a suitable textbook on the subject. Diverse as it is, a course on psychology of technology requires integration of material from multiple disciplines. As a result, specialists from different areas of study have occasionally converged to publish a few edited books on this subject, many of which are proceedings of conferences culminating in the form of edited volumes. The problem with such publications is that they lead to a potpourri of material, difficult to glue together and leaving many topics untouched or

unconnected to each other. While a few scholars have made solo efforts, their volumes cover only some specific and limited area/s of this subfield. A comprehensive textbook is missing.

Our approach for the writing of this book has emanated from a focus traditionally used in describing core psychological processes, that is, sensory, perceptual, cognitive, and affective processes. The introductory chapter begins with raising the question about the growth of psychology of technology in the context of philosophy of science and the emerging field of philosophy of technology. Obviously, a subfield needs to identify clear goals which will help to distinguish it from its sister disciplines—a focus that has been raised in the opening chapter of the book. Thereon, in the next chapter, we move to explore the ways in which technology emerged in the history of mankind, aiding the human species in its search for mastery over the ravages of an unfriendly environment, and, how, in contrast today, our bid for greater advancements in technology rarely enhances survival, being used more to gratify our wants than our needs. We also focus on how, as technology starts being used for the masses, we learn that one size does not fit all, but nevertheless we seek to do so for commercial and other reasons. It generates issues concerning anthropometrics and the operation of the human body in a restricted environment—man-made or otherwise, with long-term sobering or harmful effects and the chances of its acceptance or rejection at the societal or cultural levels.

In the next two chapters of the book, we move on to the sensory, perceptual, cognitive, and motor processes, focusing on the limits of human behavior and how technology has helped us to enhance our performance and also, how a greater understanding of the human apparatus has led to growth in usable technology. In the chapter on how technology bears on our affective and emotional processes, we began with a description of neuro-aesthetics and continue to show how the design of things is so very important in taking decisions (rational or otherwise) for using them. The next chapter on virtual reality (VR) builds on the complex ways in which VR has changed our very persona and the breadth of our experiences. We have probed into how technology contributes to the formation of our “second self” as aptly argued by Sherry Turkle (2011), along with the need to understand how robotics is bringing about changes in various aspects of life, including education, therapy, and industry.

The last chapter of the book focuses on our concerns with technology, including fears emerging from the future impact of technology. While the course of human evolution is natural, the chart of technological growth would depend on what we think about our own existence in the context of who we were, who we are, and what we want to be—our understanding at the phenomenological level, our ability to seek connections with others, and overall, how we develop a sense of “cognitive collectivity” for embracing the depth and range of available technology and laying down the course of its future growth.

In writing this book, we have made several compromises. The reader might notice that while some topics are included, others have been given scant or no attention. We did not plan to prepare a compendium of psychology of technology. Rather, we focused on the need for a simple book, making the integration of material across

disciplines unembellished and easy to understand. While we acknowledge that this book could have been written in many different ways, our focus has been to align the material in terms of our understanding of the core psychological processes such as perception, cognition, and emotion in the context of technology.

We would like to thank our friends, colleagues, and students, and last but not the least, our families, who supported us throughout this venture and also provided feedback at various stages of the preparation of this book. We appreciate the patience and continued support from our publisher and, particularly, from Sylvana Ruggirella of Springer (USA), in steering this project smoothly and making it available as soon as possible.

Utica, NY, USA
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Psychology of Technology

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2016, XXIV, 384 p. 30 illus., 24 illus. in color., Hardcover

ISBN: 978-3-319-45332-3