The Weaponization of Persuasive Technology

Persuasion can come in many forms. To many, the word "persuasion" is most closely related to public speaking.

One can analyze the tactics and practices of a great public speaker - examining how they employ rhetorical devices such as metaphors, repetition, or alliteration. Beyond the content of the words, there is the delivery of the message - the inflection of the voice, the conveyed emotions, the correct pauses for emphasis.

Developing this skill requires practice, creativity, and intuition. A public speaker must not only be able to find the right words but also have the emotional intelligence to empathize with the audience, expressing the message with a music-like cadence.

Just like public speaking, technology design is a form of persuasion that has "good" and "bad" practices. It lies at the intersection of cognitive science, behavioral economics, design, and computer science. It is developed through intense study, rigorous analysis, creative input, and human intuition. It requires the ability to empathize with the user base, formulating an experience that is in-tune with their emotions and needs.

Technology Design: Best Principles and Practices

Experts in this field - who have undertaken this rigorous analysis - have developed principles and best practices that are innate to the field itself. One such expert is Don Norman, who has formerly been a professor of cognitive scientist, a VP at Apple[1], and has been labeled the Godfather of UX[2] by some.

In one of his many books on technology design, Norman analyzes the way in which designers build products that are simple to understand, yet have complex capabilities to them. He writes that "good design can provide a desirable, pleasurable sense of empowerment" and the real challenge is "to tame the complexity that life requires" with the software.[3] With this in mind, designers must strive to build in this complex capability within a streamlined interface that empowers the user to achieve difficult actions. This is the core design challenge for designers that exhibits their skill and intuition in the field.

In another of his books, Norman emphasizes that "the emotional side of design may be more critical to a product's success than its practical elements." The human experience of technology

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[1] https://jnd.org/about/
[2] https://crm.org/articles/the-godfather-of-ux-don-norman-user-centered-design
[3] Living with Complexity, pages 10-11

is so much more than its functionality. Through a product, users may want to feel empowered, joyful, social connection and belonging, respected, or a sense of achievement. On the flip side, users expose themselves to the capacity for fear, disconnection, shame, and anger.

This ability for a product to empathetically connect to the human user can be the primary driver to its external success and acceptance. This is what Norman emphasizes. A product may exhibit all the functionality, simplifying complex tasks in a streamlined way. But ultimately, the end user is a human. And their openness to accepting such a product into their life depends on the way it makes them feel as a person.

Like a public speaker, a complex message can be simplified into a structured response. The audience - a user base ready to be acquired - can then understand the functionality of the message and see the value that such a product will bring into their lives. But ultimately, how does the speaker and product make them feel, resonating with their emotions? Does this feeling open the user up to accepting the product into their lives, or will they turn somewhere else to find those emotions that they crave? This determines the extent to which individuals will incorporate the product into their daily actions, and the impact it will have on their future behavior.

How Technology Persuades Future Behavior through "Nudging"

Technology can also persuade the user's behavior by "nudging" them in certain directions. When creating a product, designers recognize that humans are not fully "rational creatures" and need guidance in making decisions. Richard Thaler, a behavioral economist and Nobel Laureate, writes that the "false assumption is that almost all people, almost all of the time, make choices that are in their best interest."[4] When designing these systems, one must create a structure of choice architecture for the user that can steer them toward a certain direction. As Thaler puts it, "if you are given fifty prescription drug plans, with multiple and varying features, you might benefit from a little help."[5]

These decisions are not black and white and the designer cannot be agnostic to this dilemma most times - they *must* make a choice that nudges the user in a certain direction. Thaler writes that there is a misconception that "it is possible to avoid influencing people's choices. In many situations, some organization or agent must make a choice that will affect the behavior of some other people. There is, in those situations, no way of avoiding nudging in some direction, and whether intended or not, these nudges will affect what people choose."[6]

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[4] Nudge, page 9
[5] Nudge, page 9
[6] Nudge, page 10

Overall, technology design has innate "best practices" to the field that have been developed over time. Similar to public speaking and rhetorical devices, these principles can be compared to the "science" of the field, where they define the effectiveness of the application in its relation to the user.

ND-IBM Research Grants

There are many ethical issues that surround the effectiveness and weaponization of this persuasive technology. Similar to how a public speaker can employ rhetorical devices that manipulate the audience's emotions for a malicious purpose, designers are capable of the same sort of persuasion through technology.

To study how we may effectively employ these principles in a responsible manner, the ND-IBM Lab awarded two grants to research projects that focused on persuasive technology and its impact on youth and adolescents.

Mind Control: Protecting Adolescents from Deceptive Design Patterns in Apps

The first grant focused on research that examined "ethical issues, including deceptive design patterns, in apps children use in adolescence." [7] In this paper, lead researcher Sundar Narayanan focuses on how these deceptive design patterns, also known as "dark patterns," nudge human users toward choices that are not necessarily in their best interests. Narayanan identified four key ethical issues in the development of these applications: Privacy, Age-Appropriateness, Human-in-the-Loop, and User Interface.

In these four areas, Narayanan illustrates how app developers exhibit tendencies to nudge users toward decisions that are best for their application instead of the human. Such tendencies include forcing "opt-out" of data collection rather than "opt-in," constraining the user to a default choice that best benefits the interests of the application.[8]

Many of these apps have also shown gaps that do not adequately protect vulnerable adolescent users from being exposed to adult content or persuasive nudges. The study reports that 85% "do not have any mechanism for age verification" while parental controls do not apply if the adolescent user simply "falsely declares age as an adult or if the adolescent uses the app without registering."[9]

It is important to recognize there are significant technical challenges to solutions that would limit these gaps. Yet, such challenges must be a higher level engineering priority for developers.

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[7] Mind control page 3
[8] Mind control page 9
[9] Mind control page 11

Narayanan emphasizes that the "long-term impacts of exploiting cognitive biases" through these persuasive design practices "have not been studied extensively."[10] When these practices are weaponized against children from a young age, their emotional and cognitive development could be severely impacted. Thus, building in the proper solutions to protect youth against these consequences would help mitigate the lasting damage that researchers are just starting to understand now.

AI Nudging

With the introduction of AI into user interface design, nudges are no longer a static practice. Persuasive design in applications now has the ability to adapt and evolve to the user's specific preferences and personal biases. The ND-IBM Lab issued a research grant to study the impact of these "dynamic nudges" and how we may build an audit framework for its use on children and teenagers.

AI nudges require "large amounts of data to provide personalized, dynamic, feedback and interfaces."[11] It is a powerful form of persuasion, one that is the "results of reinforcement learning systems that constantly adapt to the behavior of the users in ways that are often unpredictable."[12] As the system learns the user's biases and preferences, it becomes more and more effective at engaging them and influencing their behavior. This allows the system to collect *even more* data, understanding the user *even better*, and nudging *more effectively*. This results in a powerful cycle that is dangerous to human users, as it is incredibly difficult for them to escape these nudging patterns as the AI becomes more and more effective.

This systematic grip over human psychology is what former Google design ethicist Tristan Harris has referred to as "checkmate against humanity."[13] The same powerful AI systems that have bested the world's best chess or Go players are being leveraged against the attention and emotions of the average human user. They are able to systematically attack our weaknesses and vulnerabilities, strategically dissecting them in a way that leaves us defenseless.

It is like a public speaker who is able to understand every individual audience member in an intimate way. They no longer have to speak generally to the entire crowd with this knowledge. Instead, they can speak directly to each individual, understanding how to best manipulate and persuade each of them toward the action of the speaker's choosing.

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[10] Mind control page 13
[11] AI Nudging 4
[12] AI Nudging 5
[13] Harris, Tristan. "Persuasive Technology and Optimizing for Engagement." United States Congress, 2019. Page 11

With this power, it can be understood how "AI-enhanced nudges are thus intrinsically more risky as they are able to produce personalized outcomes and recommender systems that are constantly evolving in ways that are difficult to foresee."[14] In their research, Dr. Ganapini and Dr. Panai argue that "using AI-nudging to captivate the interest and attention of the user is potentially unethical as it may be even more likely to produce this kind of psychological harm."[15] With this claim, Ganapini and Panai are concerned with the extent of effectiveness with the persuasive nudging. The cognitive superiority of the AI system puts it at a significant advantage of the human users, which can damage the user's cognitive development as a result.

Beyond that, children and teenagers are especially susceptible to this type of damage. Whereas adults may be able to "overcome this influence…research indicates that this is hardly ever the case for children and adolescents. Children and teenagers might not yet have an established and clear set of values and personal choices to refer back to and they are thus more easily influenced."[16]

Conclusion

The ethics of persuasion, especially as it relates to the forms of public speaking and technology design, can be broken down into two main parts to consider.

The first consideration encompasses the extent and effectiveness of the practice of the field itself. We must allow the user and audience the opportunity for agency in their decisions. We cannot attempt to persuade them to the point of manipulation - giving them that opportunity to exercise their own choice. As a public speaker, you must not stoop to the level of fear-mongering and other malicious emotional tactics to exploit your audience for the sole purpose of "convincing them" to your side. With technology design, we must also be aware of this extent, understanding when we slide into the realm of exploitation. It is also important to consider the age of the user, as youth have not cognitively developed to a point where they have the strength to make autonomous decisions that counteract the nudging of a system.

The second consideration is the intent and moral character of the person or organization that wields the tool. What is their purpose in persuading the audience, or the user? Is it solely for power, or profit? Is there a larger social goal that is being considered? In public speaking, a great orator can wield their skills for both good and bad. Technology design is no different. To help oversee this, researchers have often proposed regulatory steps that continue to "check" the character of the private organizations that develop and apply this technology.

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[14] AI nudging page 8
[15] AI nudging page 9
[16] AI nudging page 9

As the field of persuasive technology continues to evolve, its impact on our human development and behavior will continue to grow. As technologists, we must be reflective over the way in which we launch and apply our own products. We must not become so caught up in technological exuberance, being so infatuated with the process of innovation that we overextent the effectiveness of our products into exploitation. We must remain aware of the harm this can cause to us, the human user, while also constantly being reflective over the broader purpose of our innovation process.

And to ground us, we must be mindful of the analogy of technology design to public speaking, understanding how both are forms of persuasion that have the simultaneous capacity for good or bad.