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How Conscience Apps and Caring Computers will Illuminate and Strengthen Human Morality

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1 Introduction

The biopolitics of intervening directly in the body with drugs, genes, and wires have always been far more fraught than the issues surrounding the use of gadgets. This is odd, since the rapidly changing exocortex comprising computers, smartphones, and wearables has changed the lives of billions in profound ways, accomplishing things that we are decades away from achieving with neurotechnology and brain–machine interfaces. While eventually we will have safe brain prostheses to record and recall information directly from our neurons, we first figured out how to download, store, and re-upload memory from our brains thousands of years ago with the invention of writing. Now the exocortex permits us to record photos and videos, names and places, poetry, or how many steps we've taken, and to recall all that, or the contents of thousands of libraries and newspapers, with a couple of seconds' retrieval lag. The horror and enthusiasm that our cyborg future excites clearly have more to do with the transgression of the body's boundaries than with the actual enhancements it will bring, since those enhancements are or will be accessible far more cheaply, safely, and upgradably in wearables and gadgets.

Which is not to say that there isn't a chorus of critics of the effects of the exocortex. Susan Greenfield (2009), Nicholas Carr (2011), and Sherry Turkle (2012) have become spokespeople for the dystopian view that our infatuation with gadgets, multitasking, and constant distractions from the

Net and social media is crippling our capacity for authentic attention and connection to one another. Writer Linda Stone has coined the term "continuous partial attention" (Fallows 2013) to describe our state of continuous distraction, degrading our productivity, causing auto accidents, and increasing our levels of stress about what we might be missing on YouTube, Facebook, and Twitter. Cognitive scientists are meanwhile documenting the near-impossibility of true multitasking (Loukopoulos et al. 2009), arguing that the more we attempt it the poorer our cognitive capacity becomes.

As this anxiety about the downsides of the connected life has grown, however, so also have the efforts to address these problems with digital solutions. Just as seatbelts and airbags are technologies that improve the safety of the technology of the automobile, myriad digital solutions are being developed to mitigate the negative aspects of digital life. As these technologies develop they may even allow us to improve our behavior over our natural baseline, and to enhance our capacities for flourishing, connection, and moral behavior.

In the last five years, the debate over the desirability and feasibility of moral enhancement has focused mostly on the use of specific drugs and neurochemicals to improve our capacity for empathy (Crockett et al. 2010; Douglas 2008; Persson and Savulescu 2010, 2011). Critics like Zarpentine (2013), however, have pointed out the inadequacies of our understanding of the effects of moral doping compared to the thousands of years of experience in shaping character through education and spiritual practices. In this chapter I will explore the way that conscience apps and morality software are an underexplored bridge between the traditional forms of moral enhancement and the more invasive methods that we will develop eventually. Just as our collective IQ has been raised far more by ubiquitous access to the Net than by stimulants and modafinil, non-invasive digital forms of behavior modification will likely have a far wider and more profound effect in the coming decades, even though they arouse neither as much enthusiasm nor the same revulsion as empathy pills and utilitarian gene-tweaks.

As a framework to parse these potential behavior improvements, I will use the virtue ethics schema I have been exploring in my recent writings (Hughes 2012, 2013): the core elements are self-control, caring, moral cognition, mindfulness, and wisdom or intelligence.

2   Self-control

Evan Selinger begins his essay "Why It's OK to Let Apps Make You a Better Person" (2012): "one theme emerges from the media coverage of people's relationships with our current set of technologies: Consumers want digital

willpower." But it is more accurate to say that human beings have always craved more willpower since they began to understand the benefits of denied gratification, and they have always enlisted the technologies of their time in the pursuit of self-control. Monks' robes, priests' collars, and wedding rings all enlist community support for vows of sexual restraint. From hair shirts to alarm clocks to wiring teeth together as a diet aid, we have attempted to use tools to reinforce our good intentions.

Changing your relationship status on Facebook and taking down your eHarmony profile as public commitments to monogamy are as important today as weddings and rings. We can avoid temptations by leaving the Safe Search filter on when Googling and posting our weight-loss progress on our profile. Perhaps these ubiquitous forms of inconspicuous self-control are the most effective, since they are not flagged as moral self-control. But there are also numerous tools for more conscious exercises of restraint. The psychologist Dan Ariely, for instance, designed the Conscience+ app, which lists five arguments to resist temptation and five arguments to give in to temptation, in dozens of situations, such as eating dessert, buying a new gadget, lying, and exercising.

The app StikK allows users to set up public commitments to give money to charities if they fail to stick to goals such as giving up smoking. The Urge app suggests that users delay impulse purchases so they can reach budgeting goals, and tracks the money saved toward the purchase of a desired item. In the Canadian province of Ontario, gambling addicts can submit their photographs to state-run casinos, which now use facial recognition to keep them out (Vance 2012). Tens of millions of people use online food and exercise diaries like MyFitnessPal, LoseIt, and ShapeUp, apps that allow users to share their diet and exercise progress with clinicians, family, and friends, providing the kind of social support that Weight Watchers has found so successful. Wearable technologies are also expanding the possibilities for self-control. The use of wearable devices like FitBit and BodyMedia Fit, which track exercise and calories burned, is expected to explode in the coming years, as are ways of tracking in real time many other biometric indicators such as calorie burning (Young 2013), blood pressure, blood sugar, and focus. Apps like Quicken, LearnVest, Budgt, and Mint are giving people easier ways to track their expenditures, savings, and budget goals.

3   Caring

Although the technoskeptics claim that digital distraction is impairing our face-to-face relationships and capacity for empathy, there is ample evidence that digital connection is enhancing connection, caring, and compassionate

action. In 2011, the Pew Internet & American Life Project found for instance that people who use Facebook have *more* "close, core ties in their overall social network compared with other internet users" (Hampton et al. 2011). Texting and social media allow us to maintain larger social networks, staying connected with people we never meet, and to have more constant, effortless communication with our core social network. When I went to college, I had to make an effort to write and call my mother. When my daughter went to college we set up a laptop with Skype in the kitchen to check in once a day, and faculty grouse that students are constantly in touch with their parents.

Beyond staying connected to distant friends and family, digital life allows us increasingly immediate access to the lives of people around the globe. Amidst the distractions of the information whirlwind are growing numbers of images and stories about human suffering, and increasingly streamlined ways to help people in your life or on the other side of the planet. Although the returns on clicking Like on a cause on Facebook, or re-tweeting a news item, are less than giving money or volunteering time to a cause, we can stay involved in a much higher number of causes. When aggregated with millions of other members of the digerati, "hacktivism" can generate equally momentous real-world effects on targets such as corporations and governments.

Other examples of exocortically facilitated compassion are:

- Compassion, an app that helps you identify and sponsor poor children in the developing world.
- JustGive, an app that facilitates finding, following, and giving to charities.
- Charity Miles, an app that streamlines charity walking and running challenges.
- VolunteerMatch and Save the Children's Earthquake Response, apps that connect would-be volunteers and donors to local needs.

4   Fairness and moral cognition

There is a growing body of literature on the irrational biases that shape our moral decision-making in ways that we would generally want to avoid (Greene 2009). A picture is emerging of a constant negotiation between our innate moral sentiments like disgust, loyalty, and submission to authority rooted in the old brain systems like the amygdala, and the conscious moral reasoning and beliefs mediated through the cortex. People become more censorious of immoral behavior when they smell bad odors or feel stickiness on their hands (Schnall et al. 2008). Judges give harsher sentences when they are hungry. People make different moral judgments depending on the subjects'

social status or attractiveness, and the amount of testosterone or serotonin in their own brain (Crockett et al. 2010). It is clear that we could all use some external coaching to improve our moral reasoning.

In a sense, electronic Bible or Quran study and the Christian fad for "What Would Jesus Do?" bracelets are already exocortical aids intended to improve moral decision-making. But many secular digital aids are also emerging (Selinger and Seager 2012). The New York State Bar Association, for instance, has created an app that gives users access to more than 900 decisions of their Professional Ethics Committee on issues confronting judges and attorneys (NYSBA 2012). MoralCompass provides a flowchart of moral decision-making questions, and SeeSaw allows users to query other users about which action they should take in a situation (Statt 2013). The online *Encyclopedia of Ethical Failure* is a compendium of government fraud and abuse, compiled to educate public employees about ethical lapses to avoid. The app ToneCheck screens our digital communications for coarse or hostile speech, placing an automatic hold on messages that, after reflection, we may not want to send.

Secular ethics assistants will also likely emerge from the efforts to design "moral machines" (Wallach and Allen 2011) and ethical artificial intelligence (Anderson and Anderson 2007). Some of this work is being done in order to provide onboard rules of engagement for autonomous battlefield robots, but there are applications for robots in many occupations, including industry, transportation, and medicine. The effort to codify and balance all the factual and value considerations involved in messy, human moral decision-making will be very complicated, and result in multiple possible morality settings, since there is wide moral variability in humans. Eventually, these morality AIs will become a seamless part of our own cognition, allowing us to choose consciously to act in ways we otherwise would find difficult.

5   Mindfulness

In order to act morally we need to be able to pay attention to our lives, and not constantly be distracted by rumination and digital noise. There are now dozens of anti-digital distraction apps, including:

- TimeOut, which tracks your computer use and reminds you to take breaks at pre-set intervals.
- FocusBooster, which organizes your to-do list, tracks your progress, and reminds you with an alarm to take a break every 25 minutes.
- Freedom, which locks you out of Internet access for a specified time.

- StayFocused and Anti-Social, which block access to social media websites like Facebook.
- TrackTime and RescueTime, which monitor your computer activity and give you a regular report card on the amount of time you spent on social media, email, writing and other activities.
- Spaces, Think, and Dark Room, writing programs that take up the full screen, hiding email and social media reminders.
- DriveMode, Textecution, and Text-STAR, which block talking or texting on your phone while your car is moving.
- DriveScribe, which records how well you stay within the speed limit and obey traffic signals, and gives you points to be redeemed as gift cards.
- SimpeEnergy, which tracks energy use and shares energy conservation progress with friends and neighbors.

There are also apps that remind you to be mindful at particular times or in particular places, like the Mindfulness app. The app Habit Maker lets users track how often they perform specific behaviors, such as saying "thank you" or exercising. There are apps that provide short guided meditations to do while at home, in the office, walking, or in the gym, like Simply Being or the Mindfulness Meditation app by Mental Workout.

The development of consumer versions of bio- and neurofeedback technologies, such as the mobile EEG headsets from Neurosky, Melon, and Emotiv, is currently being applied to tracking and improving meditation. Biozen, a freeware app designed for the US Department of Defense for use by soldiers being treated for PTSD, records multiple streams of information from multiple types of bio- and neurofeedback hardware, including EEGs, and provides images that react to the sensors. As these bio- and neuro-monitoring tools become smaller and less conspicuous they can also be integrated into daily life to track and fine-tune focus and attention.

6 Intelligence

Unlike the accumulating evidence of substantial effects on the brain and social behavior from mindfulness meditation, so far the apps and brain-games being sold to increase cognitive flexibility or intelligence appear to do little more than improve the capacity to perform the tasks specific to the game, such as word recall in crossword puzzles, memory in N-Back, or hand–eye coordination in first-person shooters (Melby-Lervåg and Hulme 2013). The gains in these specific skills also appear to be transitory.

Nonetheless, if we include our exocortical capacities in our definition of working intelligence and memory, the increasing ease with which we have

access to vast amounts of information is making us much more intelligent. We can remember more things and apply more and better information to our daily life. A large amount of effort is being put into online and computerized forms of education, validated with concrete learning outcomes, that will undoubtedly clarify which types of exercises do improve real-world decision-making skills. These will all start as part of our wearable exocortical assistants and ubiquitous computing environment, then be integrated with "augmented cognition" devices that finetune our attentiveness and learning, and then be integrated into the brain–machine interfaces to come.

7   Conclusions

Critics of morality apps point to the alleged inauthenticity and shallowness of behavior change when it is technologically assisted (Selinger 2012). But humans have long enlisted technology in the aid of moral enhancement, from visible markers of vows like rings and uniforms, to self- or state-imposed castration. Developing ethical software as an adjunct to self-guided behavior change – an exocortical layer to the super-ego – is only novel in its flexibility, not in its purpose. Moreover, it will be far more widely and quickly adopted than the forms of pharmaceutical and genetic modification of moral behavior currently being discussed as forms of "moral enhancement."

Because of its rapid adoption, with effects as significant as drugs and gene therapies, we also must confront some of the social challenges exocortical moral enhancement will pose. For instance, how do we ensure that these tools are not used to restrict individual autonomy and psychological diversity, and to enforce authoritarian state control or control in the workplace? The firm Citizen, which designs mobile technology, has begun collecting data from its workers on how much they exercise, what they eat, how much they sleep, their mood, and how productive they are at work (Finley 2013). While this system is voluntary, one could imagine an employer making such self-monitoring a precondition for employment, or a health insurer requiring monitoring as a precondition for a lower premium, or a state imposing monitoring on its citizens. As with all technological innovation, the potential for abuse is best addressed through political mobilization, and not by restricting the technology itself. In liberal societies, the moral exocortex will largely be self-imposed and self-controlled, and pressures from employers and the state to impose control will be resisted in the workplace, the courts, and legislatures.

If individuals have a wide variety of moral software to choose among, and these choices are self-imposed, we can hope for a robust, evolving ecosystem of moral enhancement tools, helping the average person achieve a new

level of moral self-control and consistency. Eventually these softwares will be woven into the brain–machine interfaces we adopt to augment our cognition, and become more effective than the methods of character development we have employed in the past.

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