From Ethics to Values in the Design of Mobile PINC

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ABSTRACT
Value Sensitive Design (VSD) is a promising method for addressing ethical issues and opportunities in the design of mobile technologies to promote behavior change. After positioning the work with respect to the PINC strategies (Persuasion, Influence, Nudge, and Coercion), I introduce the VSD method and analyze the role of values inherent to PINC strategies as well as values implicated by the means and ends of behavior change. Finally, I consider value tensions and differences in individual values.

Author Keywords
Ethics, values, Value Sensitive Design, PINC, persuasive technology, mobile phones

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous. K.4.2. Computers and society: Social issues.

General Terms
Human Factors.

INTRODUCTION
Values underly persuasion. Implicit in persuasion is the judgment that one behavior or outcome is better than another. But better for what? And for whom?

Here, I respond to the call for contributions about ethical issues to the workshop "PINC: Persuasion, Influence, Nudge, and Coercion through mobile devices" [7]. My approach to ethics is from the perspective of human *values* —particularly moral values such as fairness, autonomy, privacy, and human welfare. After discussing my understanding of and relationship to PINC, I introduce the Value Sensitive Design theory and methodology [12]. I then show how ethical goals, principles, and problems of PINC can be framed in terms of values and value tensions.

PINC AND PERSUASIVE TECHNOLOGY
I approach PINC from the persuasive technology community. Persuasive technology concerns the use of technologically generated or mediated information, experiences, and social cues to influence behaviors and attitudes [10]. There is attention to mobile devices within the persuasive technology community: In a collection of twenty essays on mobile persuasion, Fogg writes about the unique suitability of mobile devices for persuasion: they are intimate ("we marry them"); they are omnipresent; and they have remarkable capabilities [8]. Ethics have been a recurring concern (e.g., [3,6,15,17,20]).

The PINC framing suggests new approaches to behavior change. Cialdini's theory of *influence* gives six specific strategies that are used by people to influence each other; some work in persuasive technology has drawn on these strategies (e.g., [10,15]). *Nudge* comes from the concept of *choice architecture*: that our environment structures the choices available to us, and moreover, that there is an inevitably a default option; designers can carefully select that default to gently nudge to the desired behavior. To the best of my knowledge, this idea has not been studied explicitly in the domain of persuasive technology, although default options can be considered suggestions from the computer [10, p.126]. Finally, *coercion* ensures a particular behavior through threats and force [2]. In his framing of the field of persuasive technology, Fogg explicitly excluded coercion as distinct from persuasion [10, p.15] and always unethical [10, p.226] and . Thus, there has been little study of coercion in the persuasive technology community.

VALUE SENSITIVE DESIGN
Value Sensitive Design (VSD) is a theoretical and methodological framework intended to help designers account for human values in a principled and comprehensive way throughout the design process [12]. VSD emphasizes values of moral import and thus speaks to ethical concerns in technology design. Key VSD features include its comprehensive attention to stakeholders and its tripartite methodology [12].

VSD demands attention to both direct and indirect stakeholders: not only those who use the technology but those who are affected by its use. VSD also suggests particular attention to vulnerable stakeholders. In the case of mobile persuasion, this may include teens [5,16], U.S. Latinos and blacks [24], and Africans [25] who rely heavily on their mobile phones for communication and Web access, and may not have broadband Internet access as an alternative. Such groups should be neither neglected nor abused in the design of mobile PINC technologies.

VSD's methodology incorporates technical, empirical, and

conceptual investigations. Technical investigations concern how system features support or undermine particular values. Empirical investigations address stakeholder conceptions of values and the human response to the artifact. For example, an empirical study might present participants with scenarios designed to push the boundaries of certain values in the design of persuasive technology, similar to Page and Kray's recent study of ethical responses to persuasive technologies [20]. Finally, conceptual investigations explore the values at hand and the tensions between them. The remainder of this paper comprises such a conceptual investigation.

Elsewhere, I have argued that VSD is well-suited to address ethical concerns in persuasive technology [6]. The VSD methodology draws attention to stakeholder values and value tensions throughout the design process, so that barriers can be addressed early [6]. Here, I extend the brief value analysis in that earlier work by considering coercion in addition to persuasion, as well as mobile technology.

VALUE ANALYSIS

I consider three classes of values related to mobile PINC technologies: values necessarily implicated by the PINC approach, values implicated by particular methods of promoting behavior change, and values implicated by the desired ends. I also consider value tensions and how differences in values may nonetheless lead to the same behavior. I will draw particularly upon my earlier analysis [6] and Berdichevsky and Neuenschwander's ethical principles for persuasive technology [3].

The values of PINC

The PINC endeavor is intimately tied to the value of autonomy [6]. Autonomy "refers to people's ability to decide, plan, and act in ways that they believe will help them to achieve their goals" [12]. PINC technology thwarts autonomy when it is used to get people to do things that are against their own goals (e.g., to waste money on useless products). But PINC can also uphold autonomy, when it is deployed in support of an individual's goals (e.g., to become more active). Indeed, Oinas-Kukkonen has proposed the development of theory and methodology for *behavior change support systems* as an important direction for the Persuasive Technology community [18].

How do the PINC approaches stand with respect to autonomy? As Fogg notes, persuasion implies voluntary change [10, p.15]. Influence, too, suggests voluntariness; indeed, Cialdini shows how to recognize and circumvent influence attempts [4]. Central to the *nudge* is is the idea of *libertarian paternalism* [22]: though the designers choose a typically "best" option for the default, individuals always have the freedom to choose other options according to their own goals and knowledge. Finally, the force of coercion inherently diminishes the autonomy of the coerced [2].

When might coercion by computers be justified? As Anderson notes, "few believe that [coercion] is always unjustified, since it seems that no society could function without some authorized uses" [2]. Law gives governments a limited authority to use coercion. Deploying computers for law enforcement has potential benefits and costs, as computers lack the contextual awareness and judgment of a human being. While this might be seen as an opportunity to use computers for fair enforcement, unclouded by human biases, it can be surprisingly difficult to produce computer systems that are free of bias. Designers can encode unconscious biases in the system, unintended biases can emerge in use, and new biases can arise as a system is used in new contexts [13]. Further, although humans often blame computers for bad outcomes, computers lack moral accountability [10,14]. We should ask, who *is* held accountable if a computer's act of coercion is unjust? Thus, coercion by computer systems engages the further values of *accountability* and *freedom from bias.*

Coercive tactics such as threats may be acceptable when users have freely chosen the system in support of their own goals. Indeed, Page and Kray report that study participants found coercive "shock tactics" to be acceptable if it was the person's own choice to use the system [20]. This returns us to our earlier definition of autonomy: "people's ability to decide, plan, and act in ways that they believe will help them to achieve their goals" [12].

However, users need information to assess the suitability of the system to their goals. Berdichevsky and Neuenschander state two ethical principles related to disclosure:

> VI) The creators of a persuasive technology should disclose their motivations, methods, and intended outcomes, except when such disclosure would significantly undermine an otherwise ethical goal.
>
> VII) Persuasive technologies must not misinform in order to achieve their persuasive end. [3]

One step beyond this is the value of *informed consent* [6]: that people should not only be informed, but should have an explicit opportunity to offer or withhold consent. Friedman, Howe, and Felten identified six components of informed consent [11]: *consent* comprises *voluntariness*, *competence*, *agreement*, and *minimal distraction*, while for consent to be *informed* requires not only *disclosure*, as Berdichevsky and Neuenschander exhort, but also *comprehension*. PINC technologies that are undermined by informed consent—for example, Kaptein and Eckles's persuasion profiling [15]—deserve heightened scrutiny regardless of the acceptability of their ends. As Michalski [17] and Kaptein and Eckles [15] point out, the problem is that the natural incentives may be against even disclosure, let alone informed consent.

The values of means

Once we have decided attempt to change another's behavior, we have a number of means available for doing so. While, for example, the *nudge* approach implies a

particular mechanism for influencing choices, *persuasion* encompasses a number of means [10,19].

Many persuasive strategies, such as self-monitoring, personalization, tailoring, and social comparison [19], rely on information about the user's context and activities. Indeed, two of Berdichevsky and Neuenschwander's principles point to *privacy* as a value of particular concern:

IV) The creators of a persuasive technology must ensure that it regards the privacy of users with at least as much respect as they regard their own privacy.

V) Persuasive technologies relaying personal information about a user to a third party must be closely scrutinized for privacy concerns. [3]

Mobile phones can capture an unprecedented amount of information about the user, such as location coordinates, calls, and text messages, accentuating the need for attention to privacy [17]. But channels such as audio, photographs, and proximity also capture information about others nearby —indirect stakeholders [5]. In their empirical study of teen safety scenarios, Czeskis and colleagues learned that teens were more reluctant to indirectly share information about their context and activities with friends' parent than to share such information with their own parents [5]. Thus, in a mobile context, it is important to consider the privacy of companions and bystanders—not only the user.

Although privacy is important to many PINC strategies, we should go beyond privacy to account for values such as *identity*, *courtesy*, and *calmness* [12] when they are implicated by the means used to affect behavior. For example, consider the value of *identity*, "people's understanding of who they are over time" [12]. The persuasive strategy of *social learning*, providing "means to observe other[s] who are performing their target behaviors and to see the outcomes of their behavior" [19], should be more effective when observers share an identity with the observed. Further, if we are "married" to our cell phones, we will be more attached to applications that reflect our identities. As another example, c*ourtesy* and *calmness* are implicated by technologies that use the *suggestion* strategy. Although suggestions must be given at the right time and place to affect behavior [10], suggestions should be polite and allow the user to remain peaceful and composed—unless there is an overriding reason to otherwise.

The values of ends (target values)

As noted in the introduction, values underly persuasion. In persuading someone to act in one way and not another, we are asserting that the desired behavior will result in a better outcome. Better for what? Better for our health, for our family's safety, for national security, for the environment, and so on. Implicit in every act of persuasion is a value the persuader wants to support, a target value.

Berdichevsky and Neuenschwander address three principles to the ends of persuasion:

I) The intended outcome of any persuasive technology should never be one that would be deemed unethical if the persuasion were undertaken without the technology or if the outcome occurred independently of persuasion

II) The motivations behind the creation of a persuasive technology should never be such that they would be deemed unethical if they led to more traditional persuasion.

VIII) The Golden Rule of Persuasion: The creators of a persuasive technology should never seek to persuade a person or persons of something they themselves would not consent to be persuaded to do. [3]

All three principles focus on unacceptable ends for persuasion. They provide no guidance as to what ends would be desirable. Attention to values can lead to desirable ends for behavior change. Indeed, much persuasive technology has explicitly targeted health or environmental sustainability. Although these are laudable goals, perhaps we should also be designing persuasive technology that helps us to overcome our racial biases (*freedom from bias*), control our anger (*calmness*), and learn to help and rely on our neighbors (*trust*). Further, it is important to understand the values of those we are designing for.

Value tensions

The most obvious value tensions in PINC technology pit desired behavior changes and the values they implicate against the intention to change behavior and methods for doing so. That is, ends can be in tension with means. We see promoting health, environmental sustainability, and so on, versus preserving autonomy, privacy, and so on.

However, these are not the only types of tensions. First, the act of persuasion inherently privileges the values of the persuader over those of the persuaded. By asking you to change your behavior, I am saying that my values are more important than your values (or at least, the values you seem to be acting on). In the best case, as in behavior change support systems, the persuader and the persuaded agree on a value such as health or environmental sustainability; the persuader provides information or support to help the persuaded act in accordance with this shared value.

Second, people may agree on values but disagree on priorities. We might agree that environmental sustainability is worthwhile—but I might rate the comfort or excitement of driving as more important. Indeed, Rokeach compared individuals' value systems solely on the basis of differences in their rankings of a set of predefined values [21].

Same behavior, different values

Finally, people may agree on a desired behavior, but have different reasons for valuing that behavior. For example, five people might choose to drive below the speed limit,

each for their own reasons: to obey the *law*; to protect *safety*; to practice *thrift*; to reduce dependence on foreign oil and protect *national security*; or to reduce the need for oil drilling and contribute to *environmental sustainability*.

As Fogg points out, the mobile phone is an intimate device [8]. If it does not share our goals, but rather has goals of its own, we feel betrayed [9]. The same would seem to hold for values. Suppose that my highest value is the safety of my children. If I adopt a mobile application to help me avoid speeding, and it shows me pictures of polar bears, I will be upset. Because it challenges my values, I see the application as a threat to my autonomy, and I experience psychological reactance [1]—leading me to drive even faster. Instead, I should be reminded of my value of safety.

I see two approaches to addressing individual users' values. First, designers' value commitments should be made clear through branding and the informed consent process, so that users can make informed choices. Second, interfaces such as Todd, Rogers, and Payne's informative grocery shopping cart [23] should be tailorable. They should uphold user autonomy by allowing users to choose which information among value-laden options (e.g., sustainability, healthfulness, and cost) to display most prominently. A danger is that undisclosed, involuntary tailoring may cross from persuasion to manipulation [15,17].

CONCLUSION

Attention to values may contribute not only to understanding ethical issues of mobile PINC technology—bringing attention to concerns beyond privacy and disclosure—but also to increasing their scope and effectiveness—their power to do good in the world. Further work should clarify role of these values through empirical and technical investigations of PINC technology.

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