Promoting Ethical Technology Design Practices by Leveraging Human Psychology

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ABSTRACT

The design of technology can result in unintended and unethical consequences. Despite a recent upswing in interventions for enabling more ethical technology design, however, there is little empirical evidence on which strategies work and why. In this review and provocation, we detail how research on the psychology of belief and behavior change can help shift ethical culture within technology design teams, organizations, and the industry more broadly. We suggest three approaches, each supported by empirical evidence: (1) questioning intuitive assumptions, (2) highlighting system complexity, and (3) targeting social and organizational structures. Crucially, these three approaches rely on both individual and social mechanisms, and we propose that effective strategies will make use of the interdependence between individuals' beliefs and their social behavior to change the broader culture of ethical technology design. We provide ten suggestions that teams and organizations can implement to foster more ethical behavior and conclude with next steps.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in collaborative and social computing**; **Human computer interaction (HCI)**; **Collaborative and social computing design and evaluation methods**; • **Social and professional topics** → Intellectual property; **Computing / technology policy**.

KEYWORDS

ethical technology design, ethical behavior, unintended consequences, organizations, psychology

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1 INTRODUCTION

While a product manager at Google in 2013, Tristan Harris wrote "Change like this can only happen top-down, from large institutions that define the standards for millions of people. And we're in a great position to do something about all of this," in a presentation urging the company to value users' time and attention over profit [26]. Ten years later, the public rollout of Google's AI image generator, Gemini, was halted by its CEO after just one week because it created diverse but historically inaccurate images such as Black Nazis, female Popes, and Native American vikings [17]. These ethical challenges in the design of technology are not limited to one technology company: they are pervasive, from dark patterns [21] and privacy violations [57] to foreign interference [57] and psychological manipulation [24]. Top-down edicts alone, however, can only address the symptoms and not the cause of unethical technology design. Instead, in this provocation we suggest individual, social, and organizational practices that may support ethical culture change early in the design and development phases.

Public and political concern about the unethical practices employed in technology design have led to an upsurge in potential strategies across both industry and academia aimed at promoting more ethical behavior [16, 20, 22, 55], yet there is little empirical evidence about which strategies work and why. There exists a large body of work across the fields of human–computer interaction (HCI) and science and technology studies (STS) aimed at supporting ethical decision making by adopting various theoretical lenses (e.g., feminist HCI), methods and methodologies (e.g., value sensitive design and reflection) as well as policies and codes (e.g., Diverse Voices [35]). However, empirical evidence from the psychology literature suggests that many interventions do not work at all, vary across different contexts [50], or have effects that are too small or short-lived to be useful [39]. Not knowing what works—and what does not—both hampers the development of effective initiatives and prevents objective evaluations, leading to costly and possibly unethical design decisions down the road. Decades of psychology research has sought to shed light on the mechanisms underlying belief change, and how best to harness these mechanisms to elicit more ethical behavior. Our contribution to the DIS literature is a set of three overarching strategies—grounded in empirical research on the psychology of belief and behavior change—to enable ethical technology design practices. These strategies are not intended as fixed conclusions about which ethical design interventions are effective and why, but rather as suggestions for future empirical research in the field.

2 INDIVIDUAL AND ORGANIZATIONAL APPROACHES

Toolkits, methods, and epistemic commitments can enable designers to engage in more ethical behavior in multiple ways, as shown in Chivukula et al.'s [5] review of 63 ethics-focused design techniques. Yet, there exists little evidence as to the effectiveness of these techniques. This provocation extends the HCI and STS literature by providing empirical evidence from the psychology literature as to the effectiveness of related interventions.

Surveying decades of psychology research on promoting more ethical beliefs and behavior across domains, we provide three overarching approaches for promoting ethical decision making practices during the design and development of technology. We leverage this research to generate specific evidence-based suggestions for how technology companies and interventions might promote more ethical development of technology, but many of these strategies and suggestions may also be helpful in related industries.

First, encouraging designers and developers to question their own intuitive assumptions may be a key precursor for effective interventions to elicit more ethical decision making. Second, interventions promoting moral deliberation could be especially effective when they scaffold knowledge of the complexity and unpredictability of the system in question, leading people to see decisions as requiring information or perspectives they may lack. While these first two mechanisms focus on individuals' reasoning and beliefs, the third mechanism targets the powerful role of social and organizational structures in shaping ethical behavior. Humans are inherently social and have deeply ingrained cognitive systems for using the behavior of others to guide our own actions. Crucially, individual and structural forces can work in tandem to foster ethical culture change because people are motivated to rationalize behaviors they are already engaging in, so the most effective interventions will likely harness both individual and structural approaches as well as the interplay between them.

2.1 Questioning Intuitive Assumptions

One key tool for helping people consider new ethical perspectives is to encourage them to first acknowledge that their existing perspectives might be flawed. The potential of this strategy to change people's minds rests on the growing empirical evidence that intuition and emotion, not reason and logic, underlie many of the decisions we make in daily life [23]. Effective strategies might focus on helping people to question their own intuitions when making decisions, and to see the decision at hand as requiring information or perspectives that they don't yet have. Given the threat this can pose to personal integrity, trust that the intervention organizers are reliable and well-meaning is key [48], and interventions might be more palatable when tied into people's existing personal values [8]. People may also be open-minded when motivated *intrinsically* to deepen their own understanding than when driven *extrinsically* to satisfy requirements [13]. **Suggestion 1**: Effective interventions need emotional buy-in.

The success of an intervention could also depend on when it takes place. People are more receptive to interventions overall (like starting a new diet) when in a state of transition (like at the beginning of the month [11]) because they tend to have less deeply ingrained habits [54, 58]. This emphasis on early intervention has already been incorporated into some frameworks for responsible technology [4], [38]. **Suggestion 2:** Interventions may be more successful earlier in a project's development.

2.2 Highlighting System Complexity

A second general strategy for fostering more ethical decision making is expanding designers' understanding of the system they are making decisions about. This strategy is largely informed by the vast literature on the importance of thinking about systems as a whole, or systems thinking [42], for example by identifying the system's elements, interconnections, and functions [2]. Strategies that encourage systems thinking might foster understanding of long-term and downstream consequences of technology development decisions given the system's structure (e.g., the system's *affordances*; [12]), including strategies like moral imagination [56] or moral awareness [41]. **Suggestion 3:** Teams might benefit from more systematic cross-talk with people outside of their own area of expertise. For instance, developers might be better equipped to engage in systems thinking if they know more about what user experience researchers do and why (and vice versa).

Although having an accurate mental model of a system is important, one pitfall with strategies that focus *only* on increasing systems thinking is that people are often motivated to justify their existing beliefs, and deliberating can provide an opportunity for post-hoc rationalization [27]. People's beliefs about their own knowledge after they have thought extensively about a decision can even lead them to be overconfident in their ability to make accurate predictions [49]. Perhaps the same overconfidence is what led to misunderstanding what it means to support diversity in Google's AI image generator [17]. **Suggestion 4:** Documenting and tracking ethical practices throughout the development process may be more effective than only documenting after a product has been developed, when people may be more motivated to engage in post-hoc rationalization [e.g., 35].

In addition to building actual system knowledge (i.e., understanding how technology development works, who it affects, and potential downstream consequences), thinking about technology as a system could help people realize that it is complex and unpredictable. When confronted with decisions about complex systems, where actions could have unforeseen consequences, people often hesitate to act. For example, viewing technologies like vaccines or genetically modified foods as interfering with complex and unpredictable systems (i.e., the human body; ecosystems) can make people more cautious about using those technologies [43, 44]. Viewing technology development as complex and unpredictable could make designers more cautious and lead them to seek out additional information [14], consider diverse perspectives [32], and support social structures that help safeguard against individual errors in judgment. **Suggestion 5:** Teams could engage in system mappings, speculative and reflective design practices to foreground potential complex interactions.

2.3 Targeting Social and Organizational Structures

While the first two general strategies focus on shaping individual reasoning and beliefs, with the ultimate goal of shifting behavior, effective interventions might also harness the powerful role of social and organizational structures to shape ethical behavior directly. Humans evolved as social beings, and we have early-emerging and deeply ingrained systems for paying attention to the behavior of people around us and using it to inform and adjust our own behavior [6]. A vast and growing body of research supports the idea that intervention strategies focused on shifting social norms and structures can provide powerful tools for promoting individual behavior change across a wide range of morally important situations [51] because people readily conform to what they think other people around them are doing [15, 36]. But top-down value signaling alone is unlikely to work, because people closely track mismatches between behavior and professed moral commitments and often judge hypocrites harshly [19]. For example, people see climate change advocates, especially experts, as most influential when they adopt reasonable sustainable behaviors in their own daily lives [46]. Similarly, while the CEOs of social media companies may say they care about users' privacy, their ad-driven, surveillance-like business models undermine their words. **Suggestion 6:** Changing the incentive structures within an organization so that ethical practices—and not just outcomes—are rewarded above profit may be needed for top-down values to be taken seriously.

Beyond top-down structural changes, shifting social norms can have promising effects at more local levels. For instance, some people in social networks are more influential than others because they are more well-connected, and the behavior of these social referents (as identified by their peers) can influence the behavior of people around them [18]. In one large-scale field experiment, encouraging a small set of influential students to take a public stance against bullying reduced overall levels of school conflict by roughly 30%. People are also especially influenced by the behavior of people who share their groups or identities [7]. **Suggestion 7:** Bottom-up efforts [e.g., 33] might be most effective when they target the people who have the most opportunities to interact with and influence the people around them (referents), regardless of whether they are in a position to make management decisions.

People also pay attention to *dynamic* norms, or the direction in which social norms are changing over time [10]. For example, people ordered more vegetarian dishes at a restaurant when they learned they were gaining in popularity–even though non-vegetarian dishes were, at the time, more popular [47]. In this way, behaviors that are not the norm yet can be promoted by highlighting that they're trending. **Suggestion 8:** Teams that employ certain practices (e.g., speculative design) or toolkits (e.g., for inclusive or value sensitive design) could voluntarily share this information in a company-wide forum, or code repositories and project documentation could have "badges" indicating a particular practice or toolkit was used. This opt-in model could eventually be transitioned into a default, lowering the effort required for any one team to employ ethical development practices.

Social norms also establish the "default" behavior. People usually avoid doing hard things if they can [31], and defaults can be built into social structures on purpose by shifting around features of the choice environment to make "good" choices easier and "bad" choices harder (i.e., choice architecture [52]). For example, organ donation is much more common when people have to "opt out" of being a donor [29]. Setting defaults is so powerful that these small changes can result in some of the largest effects of social interventions on individual behavior [9]. Builders of technology, like any social group, are also governed by social contracts about collaboration and coordination [53], so effective interventions might build ethics into the structure of how teams work to achieve common goals. **Suggestion 9:** Teams might document and track their ethical goals, which can help with follow-through [25]. Team-level strategies might include explicit and default structures for considering ethical consequences in teams' workflow, including strategies for setting, evaluating, and reflecting on ethical goals throughout a product's lifecycle.

Crucially, individual and structural mechanisms are interdependent, so the most effective interventions are likely those harnessing both individual and social approaches and the interplay between them [34]. People are motivated to avoid cognitive dissonance [3], and they go to great lengths to rationalize their own behavior and the social patterns they observe [30]. Targeting beliefs indirectly may be especially useful to circumvent the resistance triggered by direct attempts to intervene on people's moral convictions [45]. For example, interventions to improve energy conservation that target people's beliefs about what they should do often lead them to cling more tightly to their existing beliefs and behaviors, whereas interventions targeting beliefs about what other people think they should do are more effective at lowering their energy use [28]. People also tend to mistakenly assume that others support existing social norms, so challenging norms (e.g., through questioning intuitions and seeking new information) can weaken their power over people's behavior [40]. **Suggestion 10:** Ethical interventions should focus on whether people are behaving ethically, regardless of whether or not they are thinking ethically.

3 CONCLUSION AND FUTURE WORK

Questioning intuitive assumptions, highlighting system complexity, and targeting social and organizational structures are just a few examples of intervention strategies that build on psychology research. More importantly, to change ethical culture within the technology industry, the ultimate goal of any intervention should be to shift social and structural norms. Relying on lone "ethics evangelists" is risky—both because of the danger of post-hoc rationalization, and because social and organizational structures can hamper the effectiveness of individual efforts [1]. Social structures are created and re-created by the people within them, and enacting change in large organizations or industries may only really be feasible by strategically intervening at the individual level, especially if those people are influential social referents who set the standards for the people around them [18]. As the speed of technology development accelerates, principles alone cannot guarantee ethical technology design [37]. Intervention strategies targeting individuals will probably have the most lasting impact when they are part of a broader cultural shift, especially by relying on people in positions of power and influence within organizations. Further empirical

research within technology companies and educational contexts will be necessary to understand the power of these strategies to promote ethical decision making in the technology industry and how best to implement them.

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