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Responsibly Persuaded: An Exploration of the Ethics of Persuasive Technology

Joseph E. Price
Purdue University

RESPONSIBLY PERSUADED: AN EXPLORATION OF THE ETHICS OF PERSUASIVE TECHNOLOGIES

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Joseph E. Price

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STATEMENT OF COMMITTEE APPROVAL

Dr. Colin M. Gray, Chair

    Department of Computer Graphics Technology

Dr. Mihaela Vorvoreanu

    Department of Computer Graphics Technology

Dr. Marisa Exter

    Department of Curriculum & Instruction

Approved by:

    Dr. Colin M. Gray

        Graduate Program Co-Chair

    Dr. Bedrich Benes

        Graduate Program Co-Chair

To my family at home
and the staff at Purdue Christian Campus House
for all their love and support.

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ABSTRACT

Author: Price, Joseph Ellis. M.S.
Institution: Purdue University
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Committee Chair: Colin M. Gray

The pervasiveness of technology comes with an increased risk for negative outcomes. Responsibility must fall upon designers to anticipate problems and guarantee positive outcomes. The concept of design character is the basis from which they assume responsibility. The goal of this study was twofold. First, I sought to understand how designers persuade users or stakeholders, and through what means. Second, I sought to critically evaluate aspect of persuasive design through the lens of ethics and values. This study provides an understanding of the criteria and philosophies of ethics relied upon to evaluate persuasive technology.

To address both research goals, a total of 6 user experience designers were interviewed using a semi-structured interview approach. These interviews were centered around evaluating one of two persuasive technologies. A thematic analysis approach was used to familiarize and understand the data collected from these interviews. Results show that participants relied upon criteria inherent to the user, device, context, and communication. In addition, results show how three primary framings of ethics, deontological, consequential, and pragmatic, are relied upon by participants.

CHAPTER 1.   INTRODUCTION

Technology is pervasive, touching every part of our lives, and continually shaping the way we experience reality. Mark Weiser, who proposed the concept of ubiquitous technologies, uses the imagery of technologies that disappear and weave into the very fabric of our lives (Weiser, 1999). For example, today we have computing technology that exists in the form of everyday objects such as phones, watches and appliances. People can use these devices without much active awareness.

Technology's pervasiveness has increased the visibility of the value-laden and moral outcomes technology has on society (Friedman & Kahn Jr, 2003). This is reflected, in part, by Human Computer Interaction's (HCI) explicit focus on values and ethics. It is also reflected, in part, by the interest in ethical conversations within persuasive design (Torning & Oinas-Kukkonen, 2009). Starting in the late twentieth century, there was increasing interest in human values and ethics within computing. Langdon Winner (1980) was one of the first to argue within computing circles that technology is not value-neutral, that technology has the power and authority to shape our lives and impact our social relationships. This power often comes into conflict with the behaviors and values of people, yielding negative outcomes on their daily lives. Furthermore, the decisions that designers make during the design process have value implications that directly link them to consequences (Van de Poel, 2009).

Responsibility must fall upon designers to anticipate problems and discover values relating to their design approach, thereby increasing the chance of positive outcomes. As Nelson and Stolterman (2012) describe, designers "imagine that-which-does-not-yet-exist, to make it appear in concrete form as a new, purposeful addition to the real world" (p.12). Designers create and utilize technology to intentionally add to or change the world, but designers are fallible. They cannot foresee all the possible outcomes that their decisions have and, thus, create technologies with unintended consequences (Nelson & Stolterman, 2012). Furthermore, designers can be critically blind and neglect reflecting upon the impacts of technology in the process of designing (e.g., Sengers et al, 2005; Picard, 2003; Wynsberghe 2013).

When considering the pervasiveness of technology, its potential value-laden impacts, and the fallibility of designers, there is always a risk of unintentionally causing negative consequences.

However, a greater understanding of ethical activity within design can help designers, educators and scholars mitigate this risk.

1.1   Purpose of Research

The purpose of this research study is to critically evaluate aspects of persuasive design through the lens of ethics and values. HCI researchers have been critical of persuasive technology approaches, noting that these approaches are often narrow-minded and do not include attitudes and unintended consequences as criteria for design or evaluation (Brynjarsdottir et al., 2012; Purpura et al., 2011; Yetim, 2013). To build upon this area, this study provides an emergent description of design activity within this space and engages in describing ethical activity. This understanding of design can, in turn, inform future research.

To address this research goal, I conducted a study using a semi-structured interview approach. In total, I conducted six interviews with user experience designers. User experience designers were chosen for this study because that discipline is closely associated with HCI. These interviews were focused on the evaluation of one of two existing persuasive technologies. I selected two technologies for these evaluations as probes based on common persuasive strategies and areas of focus within persuasive technology. Each technology was divided evenly among participants. Throughout each interview, I sought to capture the experience of evaluating each technology. Interviews were audio recorded, transcribed and analyzed using a thematic analysis approach (Braun et al., 2006).

1.2   Theoretical Frame

One of my commitments as a researcher is representing ethical activity in a designer-centric way as opposed to a way that is artifact-centered or user-centered. Doing so may prove important in generating awareness of blind spots, in relation to the development of a practitioner's design character, and ultimately, more responsible design practices.

Nelson and Stolterman (2012) state that "designers must learn to accept design responsibility as something integral to each designer's character (p. 210)." Design character is comprised of a designer's core commitments such as "values, beliefs, skills, sensibilities, reason, ethics, and aesthetics (p. 210)." These commitments guide and shape design action. It is from this basis that

designers assume the role of guarantor, the one who assumes responsibility for a design (Nelson & Stolterman, 2012). Design character, discussed by Nelson and Stolterman (2012) is integral to my designer-centric approach because it manifests itself in the form of design action which, as previously discussed, has moral and value-laden impacts on our daily lives. Judgments made by a designer cannot be made without a designer's core values (Nelson and Stolterman, 2012).

The process of designing inherently involves ethics, and we can look at these underlying actions from different philosophical frameworks. These frameworks give different perspective on the commitments made by designers. This work draws upon three primary areas: *deontological, consequentialist* and *pragmatic* (Becker & Becker 2001). *Deontological* ethics focus primarily on actions themselves as being good or bad. *Consequential* ethics considers consequences to determine whether an action is good or bad. *Pragmatist* ethics looks at the potential social benefits of an action. A blending of these frameworks exists in practice, but each gives a different understanding of the role of user experience designers. I provide an emergent understanding of the ethical perspectives relied upon by user experience designers. Supported by these theoretical frameworks of ethics, I seek to address the following questions:

1. What criteria for evaluation is vocalized when junior level user experience practitioners evaluate persuasive technology?
2. How are pragmatic, consequential and deontological frameworks evidenced in these evaluations?

1.3   Research Contribution

In this study, I identify and describe criteria foregrounded by user experience designers in relation to persuasive technologies. These criteria indicate the ethical awareness of user experience designers and the features of designed artifacts that are salient when evaluated through an ethics-focused lens.

HCI scholars can look at ethical awareness through framework that link to behaviors and inscribed intentions that shape a user's behavior (Akrich, 1992). Furthermore, design scholars can map ethical awareness to different conceptual areas of design activity (Buchanan, 2001).

Additionally, the results of this research may allow scholars and educators to better identify opportunities where designers should be taught to foreground ethics and values during their design

process. Many have called for the inclusion of ethics within design education, claiming that design education should help foster ethical awareness (Friedman & Khan, 2012; Norman, 1998; Nelson & Stolterman 2012). Speaking more specifically about HCI design, Gray and Boling (2016) say, "there has been little progress developing formal and systemic pedagogical practices that support ethics in training HCI designers." The emergent understanding that this study provides gives insight into the weak or missing areas of ethics training within HCI design education.

Finally, the results of this research may also allow scholars within the field of persuasive design to identify opportunities where they can further their research agenda in relation to ethics. Scholars recognize the increased risk of these studies and have expressed concern about their ability to address ethics (Torning & Oinas-Kukkonen, 2009). The criteria raised in the analysis may identify concerns about the use of persuasive strategies that future research can address.

CHAPTER 2.   LITERATURE REVIEW

In chapter two, I will present a review of literature relevant to this study. First, I begin by discussing the concept of guarantor of design by raising the important question: who is responsible for the negative outcomes of a design? The concept of guarantor of design is raised to establish designers and the ethical activity they engage in as foci for this study. Furthermore, design judgment, the active component of design character, is presented to establish criteria for evaluation as a window into design character. Second, I provide an overview of ethics and values in design to establish the need for more ethical conversations from a pragmatist perspective. Finally, the chapter ends by establishing the need for ethical conversations within persuasive design.

2.1   Guarantor of Design

Technology is increasingly pervasive, and there is always a risk of unintentional, negative outcomes. Wiener (1985) and Weizenbaum (1972) argued that humans control technology; they say we should make wise, humane choices about its design and use. These words continue to ring true within the HCI community, but the issue of responsibility leaves this question to be answered: Who is responsible for the negative outcomes of a design?

2.1.1   Designers as Guarantor

Designers are responsible for the outcomes of a design because they assume the role of guarantor through the lens of their design character. Nelson and Stolterman (2012) identify designers as the guarantor-of-design and discuss the limits of their responsibility. These researchers argue that if one wants to be considered a good designer, there are no justifiable ways to divorce yourself from the responsibility of your actions. Furthermore, they state that "designers must learn to accept design responsibility as something integral to each designer's character" (2012, p. 210).

Design character is a designer's core. Nelson and Stolterman (2012) state that it is comprised of their "values, beliefs, skills, sensibilities, reason, ethics, and aesthetics" (p. 210). These things shape and guide the actions they take while designing, and all judgments that designers make are rooted in their character (Nelson & Stolterman, 2012).

Design judgment is an active component of design character that is both conscious and unconscious (Nelson & Stolterman, 2012). Nelson and Stolterman (2012) describe, "design judgment [as] the means and wise action - wisdom – [as] the outcome" (p.139). Framing judgment, the conscious part of design judgment, is described by Nelson and Stolterman (2012) as the means "for determining what is to be included within the purview of the design process – in other words, what are the 'edges' of the project and what lies beyond consideration" (p.148). The most important part of design judgement, in relation to this study, is bringing into conscious awareness considerations that frame decisions that move a design toward a satisfactory outcome. Considerations, which I call criteria for evaluation, serve as a window into design character. The knowledge, skills and values that designers use to shape their actions can be vocalized, captured and analyzed (Norman, 1998).

The kinds of judgments are a standard by which designers are held accountable. However, it is difficult to determine whether a judgment is considered good.

2.2   Ethics and Values in Design

So, how should we act as designers? This question, just as Wynsberghe and Robbins (2014) describe, is an ethical question. Ethics, a manifestation of design character, is a systematic expression of rules or normative commitments (Becker & Becker, 2001). The criteri participants engage with are what the problem frame is comprised of. Furthermore, ethics are often associated with professions (i.e., professional ethics; disciplinary ethics). The focus of ethics is typically centered around these questions: What should or should not be done? What is good or bad? What is right or wrong? Different framings of ethics provide different focus on normativity.

2.2.1   Framings from Philosophy of Ethics

Within professional ethics three primary scholarly framings exist. Each frame provides a unique perspective of design practice. These framings include: *deontological, consequential* and *pragmatic* (Becker and Becker, 2001). For *deontological* ethics, the focus is on actions themselves. Actions are good if they adhere to existing rules or principles. This is also referred to as 'duty' or 'honor' ethics. *Consequential* ethics focus on the consequences of an action to determine whether an action is worth taking or not. Consequential is primarily focused on the consequence and does not consider the action itself to be good or bad. *Pragmatist* ethics focus on social benefits of an

action to justify the means by looking at the current state of the world and seeking to bring preferred states into existence. Gray and Boling (2016) illustrate that a blending of these three perspectives exist in design practice, stating:

> "When a designer engages with the world, she relies on principles of action (deontological) that guide her practice and reflect her duty to the profession and to society; at the same time, she considers consequences of individual and holistic design actions (consequentialist) that may be triggered by the design of a new product, system, or service; and because designers bring new things into the world […] she engages in a pragmatic and value-laden rearrangement of the social order (pragmatist)."

In this research study, I discuss ethics from these primary framings, building upon conversations centered around ethics within the fields of HCI and Science and Technology Studies (STS).

2.2.2   Values and Ethics within HCI

Traditionally, HCI scholars have shown interest in values and ethics. Part of what is considered the third wave of HCI is an explicit focus on values, politics and social responsibility in design (Harrison, Tatar, & Sengers, 2007). This focus on values and ethics saw the emergence of value-based approaches bring more attention to value-laden objectives of design behaviors and outcomes. They include *critical design* (Bardzell et al. 2013)*, reflective design* (Sengers et al. 2005)*, ludic design* (Gaver et al. 2004)*, value sensitive design* (Friedman & Kahn, 2002) and *participatory design.* Friedman (2002), Sengers (2005), Nelson and Stolterman (2012), Wynsberghe and Robbins (2014) and others have played key roles advocating for the inclusion of ethics and values throughout the design process. This literature shows that there is longstanding interest in discussing values and ethics within HCI.

Additionally, there is also interest within HCI to facilitate more responsible design practice. For example, reflective design is a set of design principles and strategies to do just that. While reflective design is not primarily framed around ethics and values, it helps designers and users engage in socially responsible technology design (Sengers et al., 2005). These design principles and strategies incorporate elements from many trending critical approaches in HCI that enable designers to engage in critical reflection. Sengers (2005) defines critical reflection as "bringing

unconscious aspects of experience to conscious awareness, thereby making them available for conscious choice" (p.50). They write that without critical reflection, "we unthinkingly adopt attitudes, practices, values, and identities we might not consciously espouse" (p. 2). These design principles and strategies of reflective design incorporate elements from many of the previously mentioned critical approaches within HCI. They also argue that "ongoing reflection by both users and designers is a crucial element of a socially responsible technology design practice" (p. 2).

There is also interest in values and ethics within a broader area of study, science, technology, and society studies, which intersects with the field of HCI. For example, within this area of study exists value sensitive design (VSD), a framework that attempts to account for human values of ethical importance within technology design. Friedman et al. (2002) describes VSD as "a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process" (p.1). Also, within the STS, we see values at play (VAP) a methodology used for intentionally discovering, analyzing and incorporating values into game-based technology (Flanagan, Howe, & Nissenbaum, 2005). The process that they spotlight in their research involves values discovery, identifying value-based conflicts, implementation and prototyping, and values verification.

Most of this ethics-focused literature is engaged with deontological and consequential framings of ethics. However, there is now more of an interest in conversation from a pragmatic perspective (Shilton, 2013). Designers engage in more complex ethical activity than deontological and consequential framings can capture, this study seeks to engage in more conversation from a pragmatist perspective. Discussion from this perspective is valuable because it acknowledges that designers rely upon multiple philosophical perspectives.

To establish greater focus for this research, I sought to engage in ethical conversation centered around persuasive design. This next section will establish the need for ethical conversations within this area of research.

2.3   Persuasive Design

The beginning of the twenty-first century also saw an interest in persuasive design which focuses on changing attitudes and behaviors. Persuasive design research is largely attributed to the scholar B.J. Fogg who provided a useful framework for understanding and identifying persuasive technology (Fogg, 2003).

Persuasive technologies are defined as artifacts created primarily to activly shape attitudes and behaviors (Berdichevsky & Neuenschwander, 1999; Fogg, 2003; Oinas-Kukkonen, 2013). Fogg (2003) also identified seven strategies to change attitudes and behaviors: reduction, tunneling, tailoring, suggestion, self-monitoring, surveillance, and conditioning.   These strategies were used to identify persuasive artifacts for this study. A summary is provided below in table 1:

Table 1 Seven Strategies of Persuasive Technology (Fogg, 2003)

Reduction	Making a complex task simpler
Tunneling	Guided persuasion; giving control over to an expert
Tailoring	Providing more relevant information to individuals
Suggestion	Intervening at the right time with a compelling suggestion
Self-monitoring	Automatically tracking desired behavior
Surveillance	Observing one's behavior publicly
Conditioning	Reinforcing target behavior

While this framework is useful for understanding and identifying persuasive technology, it is limited in its ability to help with development and evaluation. More recently, Oduor, Alahäivälä and Oinas-Kukkonen (2014) proposed a framework called the Persuasive Systems Design (PSD) model, useful for understanding the process of designing and evaluating persuasive technology.

The majority of current research in this area is driven by theories of persuasion and social influence (Oduor, Alahäivälä, & Oinas-Kukkonen, 2014; Oinas-kukkonen et al., 2009; Parmar, Keyson, & others, 2008; Wiafe, Nakata, & Gulliver, 2014). While these theories are intended to influence behavior, they yielded unintended consequences. To address this problem, researchers drew upon software design patterns to give developers guidance for implementation (Oduor, Alahäivälä, & Oinas-Kukkonen, 2014). Design patterns are essentially general solutions to a common design problem (Alexander, 1977).

The discussion of persuasive technologies' ethics has primarily been from a deontological and consequential perspectives. Berdichevsky and Neuenschwander (1999) provided the

beginnings of an ethical discussion on persuasive technology by presenting eight principles of persuasive technology, focusing on a deontological perspective. Berdichevsky and Neuenschwander (1999) write, "The creators of a persuasive technology must consider, contend with, and assume responsibility for all reasonably predictable outcomes of its use" (p.56). Considering and contending with design outcomes shows that persuasive technology is engaging in consequential discussions of ethics.

The direction provided by researchers within persuasive design show an interest and need for ethical conversations within their area of study. Scholars who study persuasive technology, express concern about the field of persuasive systems design and its ability to address ethical considerations within published research papers (Torning & Oinas-Kukkonen, 2009). Torning and Oinas-Kukkonen (2009), in their discussion on future directions for research within persuasive systems design, state, "many research findings from the field of persuasive systems can be abused. Ethical considerations should be more clearly addressed in the research. Unfortunately, our review revealed that so far these have been poorly addressed in the published research papers."

2.4   Critical Views on Persuasive Design

Recently, there has been interest in critical conversations surrounding ethics, values and persuasive design. Critical researchers in HCI discuss improving the design approaches proposed by persuasive technology (Brynjarsdottir et al., 2012; Purpura et al., 2011; Yetim, 2013). For example, Purpura et al. (2011) offers a potential scenario centered around a system called Fit4Life, which seeks to persuade users to engage in healthier behaviors. They followed the persuasive systems design model throughout their paper and highlighted its limitations in uncovering ethics and values. Purpura et al. (2011) states that the purpose of this article was to "provoke reflection about values and politics of design in persuasive computing." Additionally, Brynjarsdottir et al. (2012) provides a critical analysis of persuasion within the domain of sustainability (Brynjarsdottir et al., 2012). They argue that persuasive technology is more susceptible to blind-spots (Brynjarsdottir et al., 2012). These researchers call for the inclusion of attitudes, values and unintended consequences as criteria for evaluation. Furthermore, they call for the inclusion of users in the design process and designing for mindfulness. The perspective these researchers highlight point to the need for more ethics-focused research within persuasive design.

CHAPTER 3.   METHODS

3.1   Data Collection

3.1.1   Sampling Strategies

To recruit participants, I adopted a criterion-based sampling strategy. This strategy selected participants who met certain criterion (Patton, 2005) and provide participants most relevant to the goals of my research. Participants were to be user experience (UX) practitioners because of UX's close relationship with HCI. Participants were expected to have 1-3 years of experience because there is evidence that recent college graduates are unprepared to handle ethical judgment and decision-making (Hart Research Associates, 2015). Participants also must have received some form of user experience education. Practitioners with different genders, races, and places of employment were selected. Participants were solicited through professional contacts from within the Computer Graphics Technology department at Purdue University and online communities using a prewritten recruitment message, as seen in Appendix C.

A snowball sampling strategy was also employed. Snowball sampling is seen as the "best way to locate subjects with certain attributes or characteristics necessary for the study" (Berg, 2007, p.72). After each interview, I asked if the participant was aware of anyone who might be interested in participating in an interview who also met the criteria for the study. I remained in contact with each participant to follow up with other potential participants.

3.1.2   Interview Sequence

A typical interview followed a planned sequence of events. Prior to an interview, participants indicated their interest in the study by completing an online form. Once a participant indicated their interest, they were asked to familiarize themselves with artifact documentation approximately and to schedule a Skype interview approximately a week in advance. Each interview followed a semi-structured format and was video and audio recorded with consent from the participant using Snagit screen recording software. See Appendix D for a prewritten message

used to schedule interviews. Basic demographic questions were collected during email correspondences with participants gathering information about their gender, education, race, current job title, and place of employment.

Six user experience designers were interviewed in sessions that were approximately 60-minutes long. Notes and reflections were also recorded following each interview to aid in future analysis. The next section describes my methods for data analysis.

3.1.3   Data Analysis

To address the first research question, "what criteria for evaluation are vocalized," an inductive thematic analysis approach was conducted. Thematic analysis is a well-known method for "identifying, analyzing, and reporting patterns within data" (Braun et al., 2006, p. 5). Data saturation was met for some of the identified themes. Following each interview, I began the process of data preparation. This process began by transcribing recorded audio in 62 pages of transcripts across all sections. Transcripts were combined into a single document. Analysis procedures followed the following phases: familiarization with data, generating initial codes, combine codes to themes, review themes defining and naming themes (Boyatzis,1998). To familiarize myself with the data, interviews and transcriptions were conducted first-hand. In addition, thorough readings of each transcript were completed. These thorough readings included highlighting and note taking, keeping in mind research questions and goals. After these thorough readings, codes were identified using exclusive coding. While there was noticeable overlap among themes, I stuck with exclusive coding to identify criteria that was linguistically dominant. Information was recorded onto sticky notes which allowed me to formulate themes. Page numbers were recorded on the sticky notes to provide structure and organization, linking the note back to its original source. I then reviewed and defined each theme. The next section reviews the rigor of my approach.

To address the second research question, how pragmatic consequential and deontological frameworks were evidenced in the interviews, a more deductive approach was taken. Each framework was used as an a priori code to analyze participants consideration. During thorough readings, each construct was identified in isolation and recorded. I then reviewed each framework to look for patterns.

3.2 Overview

To address the goals of this research objective, I conducted interviews that followed a semi-structured approach. The purpose of this approach was to understand what criteria user experience designers use to evaluate persuasive technology and to identify what ethical constructs emerge from those evaluations. These interviews were conducted through *Skype,* as opposed to face-to-face interviews, due to its flexibility within time and location restraints. Dialogical data collection was used to uncover beliefs about problems they anticipate (Guba & Lincoln, 1994). Semi-structured interviews were well-suited for this study because it allowed for opinions to emerge and for me to probe deeper into their responses.

In chapter three, I begin by describing the creation of a dialogically-focused probes. In the sections that follow, I discuss the selection of artifacts for those probes. Next, I discuss the creation of my interview protocol. Furthermore, I present sampling strategies, the interview sequence that I followed for data collection, and my data analysis approach. The chapter finishes with a description of the rigor of my method.

3.3 Creating a Dialogically-Focused Probe

To facilitate the reflection and expansion of participant responses, I adopted the strategy of using technology as a stimulus and a probe. This strategy is often used in HCI research to encourage reflection and discussion (Sengers, 2005; Hutchinson, 2003). Like reflective design, technology is used as a probe to reflect on technology design and evaluation. While reflective design focuses on technology in use, this approach presents a conceptual understanding of technology to participants. Also, while elements of reflective design exist in my approach, technology probes were used facilitate a designer's own considerations as opposed to considerations of users. A similar strategy, stimulated recall, introduces participants to an artifact to stimulate the recall of an event and what they thought during that event (Gass & Mackey, 2000).

This probe took the form of documentation that provided participants with a conceptual overview of an intentionally persuasive artifact. This documentation was used to encourage discussion and reflection. Sengers (2005) says that the "idea of the object itself can be enough to encourage reflection." Information used in this documentation was taken from public sources, such as their respective iTunes app store page or product website.

3.4   Artifact Selection

I selected two artifacts the *MiBand Fitness Tracker* and the *Happify* app for this study. Each artifact posited persuasive strategies promoted by BJ Fogg (Fogg, 1998; Fogg, 2003). Similar technologies are often discussed within HCI (Fritz et al, 2014; Intille, 2004; Ananthanarayan, & Siek, 2012; Feldmann, 2017). Each artifact explicitly focuses on changing either a user's attitude or behavior. The artifact documentation centered around these two technologies can be found in Appendix A.

The *MiBand Fitness Tracke*r and its accompanying *MiFit* mobile application was chosen because it utilizes self-monitoring, one of the seven-types of persuasive strategies outlined above. Comparable to other popular fitness trackers such as *Nike+* or the *Fitbit*, the primary focus of the *MiBand* is to influence a user's fitness behavior.

Happify, a mobile application, was chosen because it used three primary strategies: reduction, tailoring, and self-monitoring. Reduction was used by helping users with the complex task of improving emotional health. Tailoring was used to provide users with information that was relevant to them. This app also promises a way for users to monitor their emotional health and track improvements within various aspects of life. This app is primarily focused on changing a user's attitude toward their own personal happiness.

3.5   Interview Protocol

To help guide me through the interview process and ensure the collection of rich data, I created an interview protocol that implements various interviewing strategies. This interview protocol can be found in Appendix B. This interview protocol included a script that detailed what to say in my opening and concluding statements. Prompts throughout the protocol reminded me to articulate the information I am interested in and inform the participant of the purpose of the interview. Prior to scheduling interview sessions, I conducted two pilot interviews. These interviews served as opportunities to practice executing the protocol and engaging in dialogue with participants. Questions, like those found in the original protocol were crafted with the expectation

that they would elicit the kinds of responses I was looking for. The pilot interviews also provided opportunities for refinement of questions and strategies found in the protocol.

Aspects of Carspecken's (1996) critical interview approach were adopted, such as lead-off questions, follow up questions, and covert categories. Lead-off and lead-in questions were "used to start the exploration into a topic domain" (Carspecken, 1996; Gray, 2014).

Five different topics were established within this protocol: positive and negative outcomes, context, different user groups, time, and unintended use. These areas were chosen to explore the breadth of activity associated with the artifact. Within each topic area, I established follow-up questions to further explore each area. When opportunities arose, I asked "why" questions, which elicit further explanation and arrive at claims characterized by words like "would", "might", "because," "could," "should," or "ought." I crafted different types of comparison questions to encourage the sharing of new or similar ideas.

Anticipated covert categories were established in the interview protocol. Carspecken (1996) says covert categories are "items that you wished your subject to address during her talk but that you do not want to ask explicitly about because that could lead the interview too much" (p.157). Several covert categories, such as the topics of well-being and vulnerable user groups, were anticipated to be of interest to participants. I crafted follow-up questions in advance to explore those topic areas further. I pursued discussions surrounding these topics when led by the interviewee.

I also sought to incorporate various response strategies to encourage further discussion. Carspecken (1996) discusses many different types of responses to questions, such as low-inference paraphrasing, non-leading leads, validity checks, and medium level inference paraphrasing that I adopted into practice. I also sought to incorporate basic encouragement throughout the interview. The next section reports my sampling strategies and procedures for data collection.

3.6   Validity

3.6.1   Researcher Positionality and Reflexivity

No research study can be value free. Understanding my positionality, my values and beliefs, was important to understand myself in relation to the research study. My position as a researcher inevitably influenced the research design, data collection methods, and the interpretation of the

data. My position allowed me to interview participants and analyze data in a way that is meaningful to this research.

In relation to my participants, I identify myself as an insider. I am a white male who has lived in the mid-western United States for most of my life. Prior to this research, I attended Purdue University for my undergraduate education focusing in web development and graphic design. Immediately after graduation, I worked at an incubator for faith-based initiatives doing graphic design and web development work. We mobilized charitable, humanitarian, and socially-conscious work on Purdue's campus and the surrounding area. During the duration of my Master's, I continued to work part-time for Purdue Christian Campus House, a Christian church on Purdue's campus. Part of what I consider as 'good' design is heavily influenced by my Christian faith and work experiences.

As an insider I have certain advantages. Due to prior knowledge about design and design culture, I was able to ask more meaningful questions and probe deeper into participant's responses. Prior experience as a UX designer gives me the ability to understand the language used by participants. It may also be true that my positionality allowed me to be more trusted thus yielding richer and more honest responses from participants.

Positionality, for this research study, was seen as both a pre-requisite and ongoing process. Through the process of reflexivity, I became continually aware of my changing position and how I may be influencing the collection and interpretation of data. I sought to engage in the process of reflexivity after each interview session and during the transcription process. These reflections allowed me to consider how I might be affecting the responses of my participants in any given situation. Insights from these reflections allowed me to refine my interviewing skills throughout the data collection process to yield more meaningful and impartial responses. Furthermore, it also allowed me to provide a useful analysis.

3.6.2   Rigor of Approach

To account for the translatability of this study, I sought to use a theoretical framework that uses definitions and methods that are easily understood and well-known by other researchers studying design ethics. Interview materials, including an interview protocol and artifact documentation were well documented. I sought to create a well-planned interview protocol that

draws from Carspecken's (1996) interviewing approach. Also documented were formal messages sent to recruit and schedule participants.

To insure the trustworthiness of this study, I sought to incorporate various techniques into data collection. At the top of my interview protocol, I displayed my research questions. This was done to remind myself to lead a focused discussion that yielded results that addressed the questions effectively. Opening statements also provided an opportunity to recite the purpose for that time, which established roles for myself and the interviewee. This also allowed me to communicated the value I have toward participants. I also sought to use strategies that draw from work done by other well-known scholars (Sengers, 2005; Hutchinson, 2003; Gass & Mackey 2000). The interview protocol was used during several pilot interviews which provided opportunities refine my interviewing skills and the strategies implemented in the protocol.

To insure trustworthiness of analysis, I also made efforts to familiarize myself with the data. I did this by immersing myself in every step of the data collection and analysis process. I personally conducted all six interviews, took notes, and reflected after each interview. I also listened to and transcribed each session myself. Once the data was prepared for analysis, I sought to actively read the data closely, highlight important dialogue, and take detailed notes.

3.7   Limitations of this Study

While this study was successful in capturing the experiences these designers had evaluating persuasive technologies, it is important to note some of the limitations of this study.
The context of a Skype interview is a less natural context for evaluating technology. My insider relationship with participants afforded me opportunities to encourage more natural behavior. This study was limited by the time constraint of one semester to collect and analyze data. A limited amount of time meant that the number of artifacts needed to be reduced to two. Utilizing only two technologies limits our understanding to the unique set of criteria that each artifact elicits. Each artifact also utilizes its own unique set of persuasive strategies. The analysis for this study was limited to describing what criteria the participants use for evaluations. By design, this analysis does not link those criteria to specific behaviors. The analysis also focused on three primary framings of ethics and did not consider other constructs.

CHAPTER 4.   RESULTS

What follows in this chapter is a review of the results from this research study. I divide this chapter into two main sections addressing each research question. I begin by looking at what themes emerged from the analysis concerning criteria user experience designers use to evaluate persuasive technology. The following themes are presented: user inherent criteria, device inherent criteria, context inherent criteria, and communication inherent criteria. These themes provide insight into what criteria participants highlight when evaluating persuasive technology.

4.1   Sample

Communication with participants prior to the interviews uncovered basic demographic information. In total six participants agreed to be interviewed and recorded for this study. All participants for this research were employed as a user experience designer. A basic overview of the sample's demographics can be seen in Table 2 below:

Table 2. Participant Demographics

Participant ID#	Gender	Race	Highest Degree	Title	Artifact
#P1	Male	African-American	Master's	UX Designer	MiBand
#P2	Female	Hispanic	Master's	Associate User Experience Designer	Happify
#P3	Female	White/Caucasian	Master's	UX Consultant	MiBand
#P4	Female	Asian	Master's	UX Designer	MiBand
#P5	Male	White/Caucasian	Bachelor's	UXDS Designer	Happify
#P6	Female	Filipino-American	Bachelor's	UX Designer	Happify

The next section provides information on the five main themes found during the analysis of criteria for evaluation. In each theme participants will be identified by their respective ID number found in the table above. A summary of these themes can be found below in Table 3.

Table 3. Summary of Themes

Theme Name	Theme Definition	Example Criteria
Theme 1: Projected User Criteria	Criteria that are specific characteristic or attribute of a projected user	
Sub Theme: User's Completion of Tasks	Criteria specific to the users that related to the accomplishment of tasks or behaviors.	Needs Goals Desires Aspirations
Sub Theme: User's Experience Criteria	Criteria related to the user's felt experiences	Feelings Attitudes Emotions
Sub Theme: External Circumstance Criteria	Criteria related to the various circumstances in a user's life outside of their control	Physical health Emotional health Social status
Sub Theme: Social Grouping Criteria	Criteria associated with how user groups are structured and identified – a macro perspective on a user's life.	Age Religion Culture Societal hierarchy Life stages
Theme 2: Device Specific Criteria	Criteria that are a specific characteristic of the device.	Battery-life Water-resistance Ergonomics Aesthetics
Theme 3: Situation Specific Criteria	Criteria that are specific characteristic of environments of use.	Workplaces (office environments, factories) Risks Stress level Work tasks Limitations of environment
Theme 4: Mediating Criteria	Criteria that are specific to mediated relationship such as artifact-user and artifact-society.	

Sub-Theme: Artifact-User	Mediated criteria specific to the artifact-user relationship	Clarity/Ambiguity Honesty Changing disillusioned ideas Gaining confidence View of technology Balance Aesthetics
Sub-Theme: Artifact-Society	Mediated criteria specific to the artifact-society relationship	Statements/Messages to groups (religious, cultural, social) Societal beliefs Societal reactions Comparison Roles Projections

4.2   Projected User Criteria

The first theme that emerged from this analysis concerned criteria that were specific to characteristics or attributes of a projected user. Projected user criteria emerged as the most common criteria considered across all sessionw. As one participants stated, *"I would learn all that I can about them, because the users come first" #P1.* In the sections that follow, I divide up these criteria into four sub-themes. These sub themes include: accomplishment criteria, experiential criteria, circumstantial criteria, and structuring criteria.

4.2.1   User's Completion of Tasks

User's completion of tasks is defined as criteria specific to users that relate to the accomplishment of tasks or behaviors. Participants reiterated many times that they were concerned about the user's needs and goals. They articulated this by saying things like, *"how does the UI meets user's' goal?"* #P1, *"Their goals might be different."* #P2, *"How does this technology consider the needs of those users? #P3, "They have different needs and desires for using these devices" #P4, "Companies will come to us with their needs." #P5, "I would probably ask them about their emotions, what their needs are, what their goals are."* #P6 Both needs, and goals were

considered by all participants as something to discover through research. When making decisions about how users should interact with the device, how the device should be laid out, and even the aesthetics of the device, it was all to support a user's goal.

Many participants expressed variability among the goals of users:

> *"Their goals might be different, and their motivators might be different as well. So maybe I would look at that and see how it influences their successful use of the application. What are their goals and motivations are coming in because that could bring in a lot of different problems and issues." #P2,*

Combined, participants only used the word "value" a total of three times. However, participants often referenced specific things in which users place their value, such as time, work, convenience, safety, security, privacy, trust, and well-being. They also cited many possible futures, typically beginning with language like *"what if," "what happens when," "Let's say,"* or "maybe," in which they considered the "why" behind a user's behavior. In one such instance, a participant said, *"maybe a user is signing into this app for the first time and perhaps because they have not yet learned how the interface works and because there is a lack of clarity they get frustrated and don't use the app. That would be something to try and avoid, right?"* #p4 This participant's plausible thinking led them to a situation where users felt emotional discomfort, the underlying reason why they might abandon the app. Another participant considered the concept of comfort differently, stating that they may need to compromise comfort to promote their emotional health:

> *"I don't think I'd ever want to make a user feel uncomfortable. But I guess. I mean this is an app about emotional health. I'm not sure what it would look like, but I guess there are moments when they might feel uncomfortable. They might need to think about some tough things in order to move past it" #P6.*

One participant recalled an experience where they sought to discover why users go to the gym. While interviewing people at a gym for a class assignment, the participant recalled:

> *"And it was really interesting, everyone had different reasons for why they were at the gym. There was this body builder, model guy that I interview who was buff. When I asked him why, he gave me all these vain reasons why he was working out. Which makes sense -he is*

a model. But the assignment was really good. I got to learn a lot about people's motivations and what they place their worth in" #P6.

Different artifacts provoked discussions centered around different sets of values. The MiBand tended to elicit more discussions on physical well-being, security, and convenience, while participants who discussed the Happify app tended to lead the discussion toward issues of privacy, trust, and emotional well-being.

4.2.2   User's Experience Criteria

User's experience criteria are defined as criteria related to a user's felt experiences. Participants considered many different criteria to describe the nature of experiences. These criteria were considered before, during and after encounters with technology. One participant discussed how perspective shapes a user's goals: *"perspective brings about different goals. I could go through life, wake up every day, and it could be the same day every single day and live a different life every single day depending on what my perspective is"* #P2. The following criteria were used to evaluate felt experiences: attitudes, moods, impressions and emotions. Participants who evaluated *Happify* most commonly discussed how they would reinforce happiness through the design of the interface. They also considered emotions antithetical to happiness and how that might affect onboarding processes for users. *MiBand* evaluators put less emphases on this themed than Happify evaluators. Typically, participants would consider how the technology might perpetuate existing worry or apprehension toward exercise behavior. Participants consider both mitigating negative felt experiences through design and promoting positive felt experiences. Overall, participants seemed bent toward considering negative felt experiences such as frustration, discomfort, pain, fear, worry, stress, confusion and their underlying causes.

While participants never used the word "attitude," they did reference it on multiple occasions. When these designers discussed attitudes, it was centered around an object or the discovering of an object. Typical objects included: interactions, circumstances, motivations, outcomes, or various features. They would say things like*," Maybe they set long term goals, then run into a difficult time in life and it's frustrating and discouraging" #P2, "I'm not seeing positive encouragement on any of these screen shots" #P3, "Define what is negative" #P3, "it might not promote their happiness" # P5   Participants expressed that this would be uncovered during some*

sort of process that involved users. In reference discovering attitudes one participant described that they "would want to see what user's highlight and try to be as user#centered as possible." Emotions were considered most frequently with relation to the interface.

One designer who evaluated *Happify* said, *"I would come up with many user flows for people who are happy and sad. I would try to design the happiest path through the app as possible" #P6.* This participant also considered the absence of trusting and supportive relationships: *"That might lead to the user to experience some hard things maybe some fear and they might stop using the app. But it could also be a good thing. People could feel supported and motivated" #P6.* Another designer who evaluated Happify said, *"Some of the problems they might encounter is that they might feel a little bit guilty or they feel shame. Maybe they'd even feel a little bit of anxiety about what they might find out using this kind of application." # P2.* The same designer considered that users might be emotionally unaware: *"one thing to be mindful of is whether or not your user knows their own feelings and thoughts at the time" # P2.* A designer who evaluated the MiBand anticipated the following feelings toward thoughts and health:

> *"Maybe they don't want to exercise, or they feel discouraged by that. Maybe if they don't see a drastic improvement in their numbers. Maybe inside they are feeling better, but the numbers don't show much of a change. Maybe they would feel discouraged and that in order for them to feel healthier the numbers have to change" #P3.*

Another evaluator of the *MiBand* expressed that experiences with technology that illicit worry is a form of emotional harm. *"It's kind* of *tough for users whether it's something small or something big to kind of worry about something. I think that's also a kind of harm" # P4.* The same designer also said that they would engage in discovering what users feel while using the MiBand.

> *"think firstly the expression on their face or sometimes they complain about something. Sometimes they may think of other devices that might solve this. So, I could see or feel their emotions or feelings. On the other hand, it could be by some testing. So maybe I could ask them to choose some specific tasks and ask them about their experience afterwards. In more ways it could be knowing the mental of users. I could make them write down their feelings" #P4.*

4.2.3 External Circumstance Criteria

External circumstance criteria are defined as criterion related to the various circumstances in a user's life outside of their control. Participants in this study showed that they needed to consider different aspects of life that shape a user's perspective. As one participant put it, *"life happens" # P2*. Many participants considered how the uncontrollable things in life might alter a user's perspective. For them, common criteria included changes to emotional health, mental health, physical health and social status, life stages, nutrition levels. These changes were often caused unexpected, uncontrollable and unpleasant life experiences.

Participants who evaluated the *MiBand* often considered events that might alter the status of a user's physical health such as a heart attack or athletic injury. One participant stated:

> *"I think a common thing that any user group might need is a way for the app's status to change. They could even run into things in life to face. There are things we can't control in life. There are many things we can't control in life that even the healthiest people can't avoid and will be impacted by. Let say someone is running a race and tears a muscle, how might this app support them in that process?" # P3*

Participants who evaluated Happify tended to focus more on the mental health of users and how they might view the app differently. They often considered cases where users experience symptoms such as anxiety, and depression. often One participant stated that, *"It could be that within a stressful work environment that someone is depressed. Again, they might be more prone to making mistakes, perhaps it would amplify some of the problems. They might get more frustrated" #P5*. Participants who evaluated Happify also considered extreme cases where depressed users may engage in self-harm, or as one participant put it *"use the app to justify taking their life" # P2.*

Participants proposed functionality that helped users facing unwanted and unanticipated circumstances in life. For the more extreme cases a "life-line button" #P1 or a way to "bring [users] help" #P2. Others considered functionality that helps users set and reevaluate goals. One participant recalled their own life circumstances that hindered them from accomplishing their goals:

> *"Maybe it could say, 'I noticed that the momentum you have isn't there this week'. Let's reevaluate our goals and make them something achievable. Um and I guess where I am*

coming from with that would be from personal experience with like depression. If I were to use an app like this when I am well, there would be no problems. But when I'm not well and I don't meet my goals it's so frustrating and discouraging. So, then I have to say, 'Okay what are some realistic ways that I can at least achieve part of my goals.' Instead of exercising three times a week or every day, I might set something easy to accomplish, like exercise 5 min a day." #P3

This led the participant to think about a *"may-day mode"* feature that informs the system to know that they are, *"not able to reach these goals and I don't want to be reminded of how much I failed" #P3.* Once the system was informed, changes would be made to the kinds of encouragement that users receive from from the technology. For users of the *MiBand* this would be a way for them to adapt and recover from circumstances where they are injured.

Another participant considered how the app could be used to facilitate self-reflection. They considered that sometimes users set goals that are unrealistic and that users might not be aware of their true needs. One such example of this is expressed in the following string of dialogue:

"So maybe the application should help give them an assessment of where they are at. If they are doing that, how valid is this assessment? Is the application misleading them? So, these are things to be conscious of when you are a designing an app like this. Me personally, I use FitBit and I'm upgrading to the apple watch right now because they have a bunch of new features for health, right? So, when we talk about habits and changing habits especially when it's associated with health – what I've found is that I have to do a lot of personal reflection in order to get to what habits you need to change. So yes, I have all these different kinds of applications. Do they work? When you are putting your dependency on these applications, no, because you have to be dependent on yourself first and then use the application as a tool" #P2

For these participants understanding the circumstances became important for the technology to adapts to the needs of the user or for the user to reevaluate their needs.

Social Grouping Criteria

Social grouping criteria is defined as criteria inherent to users that are used to structure, organize, and prioritize information. From the participants' perspectives, some criteria they used

to evaluate data concerned how users-groups were structured. They stress the importance of knowing, *"who [their] targeted audience is" #P1*. Participants often expressed that they would ask them basic demographical questions. Some criteria that participants mentioned were: age, religion, culture, societal hierarchy, life stages, socio-economic status, problems they face, standards of living, tech use behaviors, and daily routine. They would often take a macro perspective on this, and as one participant said, *"go through it and identify patterns, identify issues, where some of these issues align correctly with the product" #P5*.

Participant 2 considered both age and education level would affect the way she would design in the following string of dialogue:

> *"If they are older and they've experienced so many different facets of life and the language, the tone, the layout of the application is going to look very different. Maybe even our suggestions for what they should do would be very different. If it's a middle schooler and their having a hard time making friends my suggestions to them are going to be very different then they would be for someone in college having the same issue" #P2.*

Overall this information placed an emphasis on who users are and discovering the most salient characteristics of users where other criteria dealt more with unseen felt-experiences, accomplishment focused criteria and task-oriented criteria.

4.3   Device Specific Criteria

This theme is defined as criteria that were specific to the device or user interface was also an emerging theme for participants. Participants who evaluated the *MiBand* considered this theme more often than *Happify* evaluators. All participants who evaluated the *MiBand* considered battery-life, water resistance, aesthetics, and the ergonomics of the device. Participants who evaluated *Happify* mostly considered interface elements.

MiBand user mostly considered physical attributes that might impede and discourage exercise behavior. All the participants considered how the device would feel up against the user's skin, and several considered the maximum and minimum temperatures it could handle. Several participants considered the need for constant Bluetooth connectivity for this device to work, stating its inconvenience. One participant said, *"They probably want to have as little weight on them as possible as they are running for their comfort" #P3*. Another said:

"I would want something that is very smart and could maybe replace my smartphone. It's just another extra device for me so I don't think it can really solve the problem that I have. Which is the inconvenience of bringing the headset and phone. So yeah, I think that is the most important problem that it doesn't solve. I don't think they solve this problem very well" #P4.

Participants who evaluated *Happify* often thought of device specific criteria in so far that it promotes the purpose of the application. *"I would hope that at the very least the app would keep that same level of happiness that users had coming in. I wouldn't want to add to their stress. So, as a designer, I would try to create a more seamless experience free of frustration that is actually pleasing to use"* #P5. The same participant also expressed that even the aesthetics of the app should be thought of in light of the purpose, stating, *"the color scheme seems to promote happiness, it's not displeasing. The colors are vibrant, and the orange generally seems to promote positive emotions. The icons are nice and pleasing to look at"* #P5.

A general belief of participants is that the technology should be easy to use. Participants said that they focus on reducing the number of tasks to accomplish tasks, creating a more intuitive and seamless interface. They also said that they would seek to improve the usability, learnability and ease-of-use of the device. One participant evaluating the *MiBand* Said, *"Some always complain why is it so difficult, why is it so hard. It should be easy. That's what I can imagine so devices that are more complex like with a lot of apps might cause more problems in my opinion"* #P4.

Overall, this information placed an emphasis on criteria that is inherent to the device. While participants who evaluated the *MiBand* thought of different criteria than those who evaluated the *Happify* app, there were generally held beliefs that the technology should be easy to use and learn.

4.4   Context Inherent Criteria

During the interview process, all six participants were led in a discussion about context, but often context would emerge naturally in discussion prior to engaging with these questions. *MiBand* evaluators often considered how a user's physical environment might impede their use of the app, while user who evaluated *Happify* tended to focus on how people in their environment might promote or impede app use. Overall, participants considered a user's workplace most often. Some

participants were more specific and considered, office environments, factories, and working in transit. I would have them describe their work day to me or their work environment. One participant said, *"I would really want to observe their work environment ahead of time, because I really think a device like this is not going to be used by someone doing work like my brother or someone in a factory" #P3.* This participant also expressed that if a designer wanted to create something for a broader audience, then *"it would be very important for them to grab a variety of workplaces to observe" #P3.* When listing off questions, one designer considered the passivity of the technology and how that might be more appropriate for work environments. *"how might the interface behave for users at work? Does it operate without users even thinking about it or are there are lot of interruptions? Does it record the user's heartbeat?" #P1.*

Furthermore, participants often considered how certain contexts might restrict use. One participant considered how some work environments have organizational rules that would prevent users from using the device. *"Any kind of environment where their hand could get snagged on something. It could injure their arm. It could injure their wrist. But usually in scenarios like that businesses require that they not wear anything on their wrist" #P3.* Another participant considered the limitations of charging the *MiBand* in certain environments. *"If you are on a business trip, or if you are going for a long day, running or hiking in the woods, it's going to be hard for them to find a plug and starting to charge it. So, it's hard for them to do that. They need to be sure that all of their devices will support them for at least 8 hours" #P4.*

Instead of merely anticipating contexts of use that might invite problems for users, one designer expressed that they would cross-reference their anticipations with what was discovered during research.

> *"So, I could actually be aware that this is an actual situation in which you might use this instead of my best guess, I would ask is this a problem that you might deal with or not? Actually, go out and dial in on that. And there may be some things that I was right about that people actually struggle with it or I may discover that I was actually wrong" #P1.*

Another participant said they would observe work tasks and environments in order to discover and identify problems and risks.

"If I see that their hands are often in locations where they might be injured by somethings, I might start to think about designing, that might give me cues that I could consider designing a different kind of thing that wouldn't be on their hands. If, you know, people… I guess what I'm trying to say is that I would try to observe people while they are working or in the environment that their work is in and wherever the product is. Then I would design a couple of different ideas and maybe build a prototype for one or two of them and then go back and do some kind of usability testing." #P3

Another designer considered how elevated stress levels in an environment might make users more sensitive to problems.

"one of my coworkers just got back from doing some research in the field. And he said that 'man that was one of the most stressful work environments I've ever seen. I don't know why anyone would want to work there.' Except he didn't say it quite so nicely. So, I guess being in an environment that is high-stress could invite some problems" #P4.

4.5   Mediated Criteria

The following sections present mediated criteria which are defined as criteria that are specific to mediated relationships. Two mediated relationships emerged as sub-themes: artifact to user, and artifact to society.

4.5.1   Artifact-User Relationship

The criteria specific to the artifact to user relationship was the most commonly encountered across all sessions. The most common criterion related to communication was clarity. This was articulated in the following ways: *"I don't exactly know how it works, just looking at the interface it's not really clear" #P1, "There isn't a clear indication of how you get from one section to another" #P3, "I think clarity is really important. If something is unclear, then users might get frustrated." #P5, and "There needs to be clear communication of purpose through the onboarding process" #P6.* These designers considered clarity vital to helping users achieve their goals, navigate through the application, and understand the role of the application in their lives. When asked about instances where users are not getting the efficiency they need from the app one

participant suggested that users might be doing the wrong activities and that perhaps they need professional help. When asked why he said, *"I think ambiguity plays into that"* #P5.

Participants had varying views on how this technology could provide motivation through notifications to overcome negative experiences. Several participants said that they would send tailored encouraging messages that depended upon the user's circumstances and background. Others believed that it doesn't always work.

> *"I get these notifications giving me some sort of encouragement and there is also the ability to track my progress over time and set goals. FitBit has all these things to help me feel motivated, but I don't know if it always works. And for me… I consider myself a very self-aware person. I can tell if this is working or not. Any sort of motivation I have to work out doesn't come from my FitBit"* #P6.

One participants said that they would use messaging to overcome negative views toward the technology saying: *"For them, if you want them to overcome this idea of it, you must persuade them to wear these electronic devices"* #P4. Another said that they would use communication to *"gain the user's confidence and ensure them that this is going to maintain privacy"* #P1.

Several of the participants considered how communication might be giving users a distorted or dishonest view of technology. Participant #3 who evaluated the MiBand said that they would want to *"make it known to users that it's a good app for monitoring your condition but it's not going to be your catch all for health"* #P3. She later went on to say that, *"I think it can be easy for people who try exercise apps or fads or devices to think that is all they need to have all the support that they need to change"* #P3. Participant #2, who evaluated Happify, began by saying, *"If a perfect piece of technology can't help me, especially when there is evidence and all these testimonies, they may think 'maybe I'm not worth helping, maybe I can't be fixed.' That can really damage a person's confidence and their ability to do something"* #P2. She later said that designers should take a step back to *"see how technology gets it wrong"* #P2. She believes that because of messaging users are *"constantly seeing technology get it right"* #P2. She would say that this is feeding users a distorted view of reality because *"life is not perfect"* #P2.

Participant #2 took this consideration further saying that that messaging should be balanced to give users an honest view of technology.

"We should ask ourselves, 'how do we celebrate our losses as much as our wins?' Right now, technology just celebrates perfection. That win. That accomplishment. Look at how cool life is. Bad stuff happens, and it has more of an impact than people realize it does. […] The pros of bringing these things together is that it brings balance. It tells people that there are good things in life and there are bad things in life. Here is how you can focus" *#P2.*

Another participant, when discussing a situation where users might face harsh realities said that "*I think I would want the app to be honest with me*" # P6.

4.5.2   Artifact-Society Relationship

Other considerations centered around the relationship between artifacts and society. Participant 1 considered multiple scenarios where the *MiBand* might send a negative message to religious and social groups. Also, included are the beliefs and potential responses that these groups might have. In a discussion about different cultures, the participant said:

"In some other cases it might be culturally seen as either A: you're being a show off if you're using this device and you get excommunicated. You are showing yourself off too much by wearing that. Amish people for example, they would not use a FitBit because it sends other people a message that they don't want to send" *#P1.*

In a separate discussion, the participant considered what message this might send to his friends. "*and if I were going out at night with friends I might want to wear something more stylish. I might not want to wear something workout related, out of fear of being looked down upon*" *#P1.* For this participant, technology becomes a fashion statement to people around him that he might not necessarily wish to project. Another participant who evaluated the *Miband* considered how tailoring and liking might shape society saying:

"the promise of these AI is that it is going to get to know you personally and know that you want and what you like to do and what you like to think, and how you like to work. They are moving toward this tailored generation where before it was like 'it's all about me' now it's like 'straight tailored for your liking.' And I ask myself, 'is that going to increase the

gap of this issue of constantly comparing ourselves against others.' Or are we going to go
in the opposite direction a care more about myself and my liking" #P2.

For this participant the worry is that a tailored messaging might cause users to fall deeply into
habits of comparison or self-centeredness, which may have negative impacts on society.

4.6   Ethical Constructs

In the sections that follow I will present examples of deontological ethics, consequentialist
ethics and pragmatist ethics that were relied upon by participants. Each frame of ethics is shown
in isolation. These examples were chosen to summarize example of each type and their relationship
to the artifact. Following this section, I report a case scenario that shows frameworks being relied
upon in proximity to each other.

4.6.1   Deontological Ethics

In this first section, I present an example of deontological ethics found in data analysis.
"I would learn everything about them. I would learn as much as I can because the user comes
first" #P1. In this example, this participant sees it as his duty to learn as much as he can about
users who might be at risk. Participants in this study often saw it is as their duty to consider users
first and designers second. This sense of devotion to users appears to be a common guiding force
for these designers. While blending did exist, participants who evaluated the *Happify* app tended
to rely more frequently upon this frame than evaluators of the *MiBand*.

Another example of deontological ethics was found in a conversation with participant #2,
who considered a moment where she need to compromise the trust of a friend to fulfil her duty as
a residence assistant. This story was told when the participant considered whether it was okay to
break the user's trust.

> *"As an RA this came up. It was pretty hard. A student came up to us and actually told us*
> *they were sexually assaulted, depressed and having suicidal thoughts. We had to break*
> *confidentiality and tell someone. I was put in that situation twice and I felt like the worst*
> *person in the world. I come from a background where if someone comes to you and trusts*

you with something you do not repeat that or go home and talk about it. If they did you don't trust them" #P2.

The deontological frame existing in this scenarios in several forms. First, she considers the action itself as wrong. She sees that it is her duty as a friend to not compromise trust and that breaking someone's trust is wrong. Here she draws upon experiences from her background to shape her commitment. This commitment comes into conflict with her duty as an RA where she is obliged to follow rules that say you must break confidentiality in this situation.

4.6.2   Consequentialist Ethics

In this example participant 2 thought of an extreme case where users might be experiencing suicidal thoughts. For this *Happify* evaluator, the negative consequence of potential suicide shapes her decision to send the police to rescue the user. Here the behavior is considered briefly but it is merely acknowledging that a compromise is being made. *"If things go dark, and if they are having suicidal thoughts, then the police are on their way. It may be that you have to compromise some really personal information, like maybe tap into their location at the time and you could bring them help" #P2.* While a blending of the deontological and consequential frame existed for *MiBand* evaluators, they relied more heavily upon the consequentialist frame.

Here participant 3 considers a long list of possible futures and negative projections that shapes her decision to come up with an alternative design for users. Developing other options is not considered to be good or bad.

> *"Let's say they are working in the fast food industry, they could easily spill something on it. If it gets damage, that could be a huge blow to them financially. Chances are there are situations where they might forget to take it off and they may really want to monitor their physical activity at work even though it is not a safe place. Let's say they do work construction. Maybe there is dust flying around and depending on what kind of construction work you do, something could fall. Whatever the risk to the human is also the risk to the device. If someone is working in a warehouse perhaps they could get it caught on something while they are using a hand saw. A lot of times that is fast paced work and if they are not careful it could get caught and cause bodily injury or injure the device. Again,*

these are all just hypothetical. If it was a more casual work environment, I would see no harm in someone having this on their wrist. I guess for more physical laborious work I think there is higher risk of this getting damaged. Some other options might be better" #P3.

4.6.3 Pragmatist Ethics

In the following example participant two balances a variety of criteria. Participant #3 looks an existing state where technology celebrates perfection, wins, and accomplishments. This participant seeks to challenge that notion of success.

"I would look at celebrating losses just as much as wins. To start teaching and showing people that it is okay to not have a constant win. These applications are constantly focused on a goal and how fast you can get to that goal. Nothing focuses on, 'you had a bad day.' You've been dropped. I have a little smart scale, and every time I gain weight it has this little angry face, and everything is red. When it's green it's happy and celebrating. And it's like, nothing will change. The next day I'll be in the green. If you during a lot of water, you can gain 5 pounds. Weight fluctuates. And that can actually be really discouraging when the application keeps telling me I should be mad and angry. We should ask ourselves, 'how do we celebrate our losses as much as our wins?' Right now, technology just celebrates perfection. That win. That accomplishment" #P3.

Here the participant considers the consequence of discouragement when her scale reminds her that she failed. She also considers that weight fluctuates to rationalize that the technology is not getting things right. She also expresses a commitment to the belief that people should celebrate losses as much as wins. She imagines a world where technology celebrates losses just as much as wins.

4.7 Case Scenario

The previous sections considered each construct in isolation, but each construct appeared to exist naturally in proximity. In the section that follows, a single case is presented to illustrate this, but this pattern was found in all participants. I highlight and examine when a participant appears to rely upon deontological, consequential or pragmatic framings of ethics.

When participant #5 encountered a more general question regarding the problems he would anticipate with the app, he responded in the following way. He anticipates that users might have a hard time conceptually understanding the purpose of the app, a negative consequence. This participant feels some obligation to bring clarity to that purpose. This also seems to guide his future thoughts and behavior. He looks at how things are now and sees that they could be better.

> *"Okay, Yeah. Some issue that users might have, without really diving into the app and how it is built and being able to understand how usable the interface is. Just conceptually understanding the purpose of it, the purpose seems fairly clear, it is to make life happier. Just looking at the interface though there are some things that are supportive of that and some things that are not" #P5.*

The first things he considers is how the application gets things right citing criteria like the color scheme and the aesthetics of the icons in relation to promoting happiness and positive emotions. *"The color scheme seems to promote happiness, it's not displeasing. The colors are vibrant, and the orange generally seems to promote positive emotions. The icons are nice and pleasing to look at" #P5.*

He then considers some negative aspect of the interface, first by indicating that there isn't a clear path forward, that they don't use traditional icons for navigation and the lack of message clarity used in the various options on the screen. Here he seems to show a devotion to tradition, that going against tradition can compromise a user's ability to navigate successfully through the application. I can also see here that he considers felt uncertainty as a negative consequence.

> *"The first screen here seems like the home page but there doesn't seem to be a clear path forward. I don't see some of the traditional icons for navigation, like the three bards, so I'm a little but unsure of where to go from here. It looks like where the navigation icon typically there is this tag. I'm assuming that has something to do with navigation. There seems to be a lot of different options and none of them seem really clear. Savor. Yeah, I don't know" #P5.*

In this next section of dialogue, the participant considers the commonality of a call to action but also considers this to be unclear. I infer here that he is weighing the use of traditional techniques against the lack of clarity found in the call to action.

"There is a clear call to action though, it says, 'play now' and that's a pretty common marketing technique. But it's kind of unclear where users are being called to. What are they playing? It looks like it might have something to do with being uplifted" #P5.

When asked why these things are important, the participant reverts to his commitment to promoting the purpose of the application. He considers it a negative outcome when the technology demotes that purpose.

"Well, just thinking back to the purpose of the app everything should seek to reinforce that purpose. You don't want to do anything that would cause the users to feel unhappy. And I would think, at its best the app should promote happiness and at its worst it should have no effect on the user's happiness" #P5.

When probing deeper about negative outcomes, the participant brought some further clarity to this. In the following string of dialogue, the participant considers a hypothetical scenario where, if the color scheme was unpleasing it may cause people to not like the app.

"Okay, negative outcome. Well, it might not promote their happiness it may make them feel unhappy. If the color scheme was not good for example, if it was an unpleasing color scheme that might cause the users – perhaps as a first impression – to not like the app. First impressions are important, and the colors overall should promote happiness" #P5.

Following that thought, the participant considers that a lack of clarity may cause the user to feel the negative outcome of frustration. Following this, he mentions his duty to the app's purpose of promoting happiness.

"As for the call to action and some of the navigation um, I think clarity is really important. If something is unclear, then users might get frustrated. There needs to be a clear path forward. I could potentially see a user possibly getting frustrated which would be an outcome you'd want to avoid. At the very least it should have no effect on the user's happiness" #P5.

I then proceeded to ask the participant how he would know if something promotes happiness. For the colors, he expressed that it was more of general feeling. "the color scheme just looks good"

#P5. He then makes a vague reference to accumulated knowledge within the discipline of user experience design and his association with that discipline. Here I infer that the participant is devoted to this body of knowledge in relation to his identity as a user experience designer.

> *"As for the other things, I mean, we've gotten pretty good at designing user interfaces in a certain way that promotes clarity and usability but to uncover some of the not so obvious things I think I'd need to do some research. Maybe I would ask users to accomplish a few tasks of their choosing and see if they arrive at their goal or not" #P5.*

CHAPTER 5.   DISCUSSION

5.1   Summary of Results

The evaluation of persuasive technology by each participant presented important insights into the questions I sought to address. In regard to the first research question, four important themes provide insight into what criteria for evaluation are vocalized by participants. These themes include: (1) projected user criteria, (2) device specific criteria, (3) situation specific criteria, and (4) mediating criteria. The first theme, projected user criteria, is defined as criteria that are a specific characteristic or attribute of a projected user. This theme is divided into four sub themes centered around user's completion of tasks, a user's experience, external circumstances, and social grouping. The second theme, device specific criteria, is defined as criteria that are a specific characteristic of the device. The third theme, situation specific criteria, that are a specific characteristic of environments of use. The fourth theme, mediating criteria, are criteria that are criteria specific to mediated relationships. This theme is divided into two sub themes pertaining to the artifact-user relationship and artifact society relationship. Addressing the second research question, my analysis demonstrated how ethical frameworks were evidenced in the participants' evaluations. I described examples of primary ethical philosophical frameworks existing in isolation, using a single case to illustrate groupings of ethical frameworks existing in proximity to each other.

5.2   Designer Positionality

The results of these sessions can be used to understand which position a designer is implicitly or explicitly relying upon and how that reveals their understanding of their role as guarantor. First, this understanding shows what kinds of ethical discussions user experience designers are able to have. The nature of our discussions centered around primary users, negative felt experiences, and extreme cases where the user might experience harm. Second, these findings highlight potential opportunities for entering into ethically-centered conversations with user experience designers. These opportunities may take place throughout the design process, training sessions, evaluations, and in academic settings. Third, these understandings highlight weak or missing areas where

designers may need more ethical training. Finally, understanding which position these participants are relying upon brings more focus to research on ethical activity within HCI design.

5.3   Implications for Design Education and Design Practice

I suggest implications for both design education and design practice. Results across all sessions showed that participants can engage in ethical conversation. These conversations facilitated the discovery of considerations that wouldn't have otherwise been thought of. A challenge for design education is to participate in and foster these conversations among their students. A design practice must also address how they can make these kinds of conversations occur more naturally and practically within work environments. Design practice can seek to apply methods found in this study in a way that fit organically within natural work environments. These kinds of conversation may also highlight week or missing areas, which serve as opportunity for engaging in correction or a more focused time of generative thinking.

5.4   Limitations and Opportunities for Future Research

In this section I suggest limitations and opportunities for future research. One of the limitations of this study was a small sample size. Future research that utilizes a larger sample size is needed to further understand the different kinds of criterion and ethical constructs shape the behavior of user experience designers. This research may further verify and validate the findings of this study.

This study also focused on participants with relatively the same education level. Future research may seek to utilize a more homogenous sample in terms of education level. Future research needs a sample that represents a variety of education levels and institutions to more accurately represent user experience designers. One may also include various forms of online institutions and certifications.

Several kinds of persuasive technology were used in this study. Further research may explore a variety of persuasive technology that invite their own unique set of criteria. Examining a variety of different artifacts may also show relationships between criterion and certain types of technology. It would also be interesting to engage in discussion around more politically charged technology, as well as technology that utilizes different persuasive strategies.

Another limitation of this research is that it links are not made between criterion and behaviors. Criterion for evaluation may also be understood through a framework that links one's beliefs to their behavior. The criterion that participants vocalize can be mapped onto various intentions and behaviors. This may identify relationships that exist among various behaviors and criterion.

The analysis of this research looked at only three primary ethical philosophical framings. Future research should consider looking at other popular framings to see if they are relied upon by designers. These frameworks were also primarily looked at within isolation but as shown in my results they are interwoven in conversation.

This research also looked at criterion in isolation. Another opportunity for research would be to identify what groupings of criteria emerge together. Doing so may identify existing relationships between criteria. Criteria was also considered separately from ethical frameworks. Studying both together might identify relationships between criterion and ethical frameworks.

5.5   Conclusion

The exponential growth of technology and its increased pervasiveness in our lives has made visible the political and value-laden impacts that technology has on our lives. With this growth comes an increased risk of unintentionally causing negative consequences to occur. Responsibility must fall upon designers to anticipate problems and guarantee positive outcomes. Designers of technology are left to wonder: How do I bring about a desired outcome? How do I shape the attitudes and behaviors of users? How do I know what is good? The purpose of this study was twofold. First, I sought to increase the design community's understanding of how designers persuade users or stakeholders, and through what means. Second, I sought to critically evaluate aspect of persuasive design through the lens of ethics and values.

A designer's character is implicit in guiding their behavior and is the basis through which they are responsible. A designer's character is also implicitly and explicitly linked to ethical and philosophical framings (constructs of ethics). These understandings lead to the following research questions: What criteria for evaluation arise when junior level user-experience practitioners evaluate persuasive technology? What constructs of ethics arise from these evaluations?

To address both research goals, I conducted an interview study using a semi-structured interview approach centered around the evaluation of persuasive technologies. Two technologies

were selected for these evaluations and divided evenly among participants. A thematic analysis approach was used to become familiar with and understand the data collected from these interviews. A thematic analysis approach was used to familiarize and understand the data collected from these interviews. Results show that participants relied upon criteria inherent to the user, device, use contexts, and messaging. In addition, results show how three primary framings of ethics, deontological, consequential, and pragmatic, are relied upon by participants. Results show that participants relied upon criteria inherent to the user, device, use contexts, and messaging. In addition, results show how three primary framings of ethics, deontological, consequential, and pragmatic, are relied upon by participants.

I then discuss these finding considering other research centered around language is implicit in design. I show how it is important to research centered around a designer's intentions. I also consider different conceptual areas that scholars might consider mapping values to. I share why these results should matter to design education and persuasive technology. The discussion concludes with possibilities for future research.

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APPENDIX A. ARTIFACT DOCUMENTATION

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MIBAND
A WEARABLE FITNESS TRAKER

MONITOR YOUR DAILY FITNESS

- Monitor activity levels
- Track walking distance
- Calculate calories burned
- Measure the length and quality of your sleep

VIEW
REAL - TIME
PHYSICAL
ACTIVITY
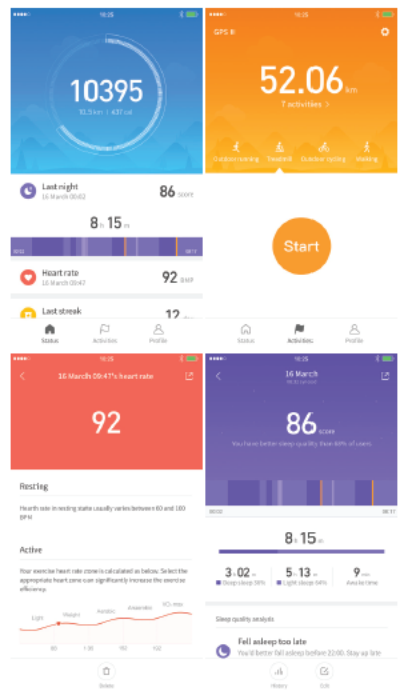### THROUGH MOBILE APPLICATIONS

UNDERSTAND
YOUR EVERY
MOVE

MI FIT MOBILE APPLICATION

- Set, track and follow your health and fitness data.

- Synch your data from Mi Band

- Connect Apple Health to share steps calories and weight data.

- Vibrates your band when you have an incoming call

SHARE YOUR WORKOUT INFO, RUNNING ROUTES, AND PERSONAL RECORDS WITH FRIENDS USING FACEBOOK AND TWITTER.

ITUNES SCREENSHOTS

51

FIND THE RIGHT TRACK FOR YOU

- Conquering negative thoughts
- Coping better with stress
- Building self-confidence
- Fueling your career success
- Achieving mindfulness through meditation
- 30+ more!

"EACH TRACK CONTAINS BITE-SIZE QUIZZES, GAMES AND ACTIVITIES THAT GUIDE YOU TO SEEING MORE POSITIVE ASPECTS OF DAILY LIFE."

- The New York Times

ITUNES SCREENSHOTS
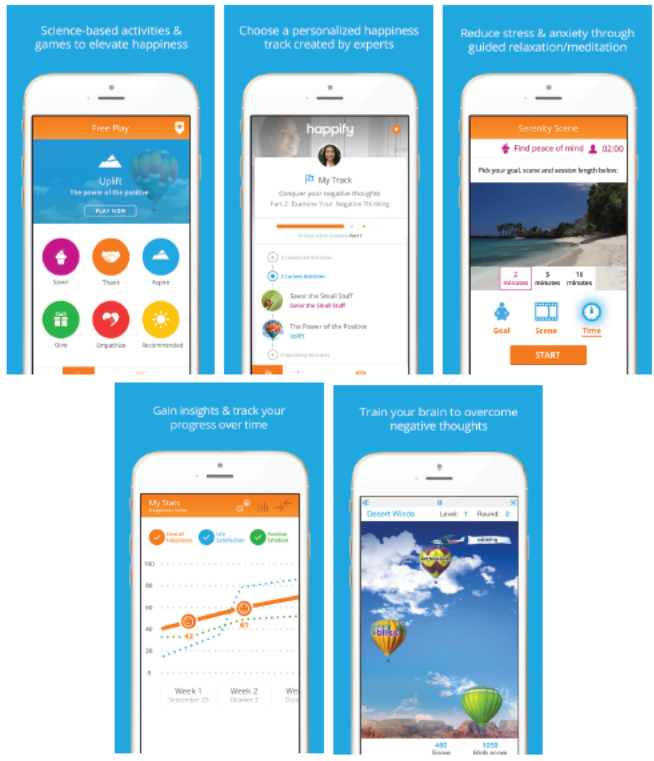
APPENDIX B. INTERVIEW PROTOCOL

INTERVIEW PROTOCOL

Purpose: To explore what criteria for evaluation and constructs of ethics arise when participants evaluate persuasive technology.

Time Limit: 60min

Before The interview:

Scheduling the Interview

Participants will be asked to schedule an interview time.

Inform Participants of Interview Method

Several days prior to the interview, all participants should be informed of the interview method (Skype), and provided information on how to acquire the software.

Sensitization to the Artifact

Participants will be sensitized to the artifact through a guided discovery. Several days prior to the interview a document will be given to participants that provides them with an image of the technology a description of the technology found on iTunes and the products website, and screenshots of the product. This information will be provided to the participants two days before the interview.

A lot

Opening Statements (3 min)

Thank you for agreeing to participate in this interview. I really value your perspective and contribution to my work. During the interview, I will present you with an existing technology, and ask you consider challenges that users might face that the technology causes.

These evaluations are being conducted so that I can understand more fully how designers anticipate challenges and design in responsible ways. As part of the transcription and data analysis process, I will redact your name and any personal information you share, and this information will not be directly attributed to you in any final report.

Artifact Evaluation (50 min)

Lead-off Question:

If you were evaluating this technology from a UX perspective, what are some problems that users might encounter using this technology?

Backup Lead-off Question(s):

What unintended consequences do you anticipate users might have to confront?

Follow-up Questions:

Lead-in Question:

What are some negative outcomes that you anticipate users experiencing?

Positive vs Negative Outcomes

- How is a positive outcome different from a negative outcome?
- As a designer, how would you know if an outcome is positive or negative?
- What factors vary between positive and negative outcomes?
    - Why would you use this distinction to consider whether something is a good design?
    - Why did you think of these factors?
    - Why did you think of these causes?

Lead-in Question:

As a designer, can you foresee situations where problems might become more apparent?

Context

- Are there unique contexts that might cause a user to interact differently with the app?
- What different factors can you identify that might lead to negative outcomes?
- How would you as a designer address these kinds of situations?
- In what different situations might users not get the value that they want out of the app?
- Can you imagine a situation in which this app could end up causing the user harm?
    - How would you address these kinds of harmful situations in a proactive manner?

Lead-in Question:

How might problems that typical users encounter be different from problems that atypical users encounter?

User Groups

- How might the technology be used or conceptualized differently by other user group(s)?

- As a designer, how would you address problems anticipated among various types of users?
    - Why do you anticipate this difference?
    - Why do you think this challenge is similar for these two user groups?
    - Why do you think this challenge is different?
    - Tell me more about this.
    - Why did you think of this problem?
    - Why did you think of this outcome?

Lead-in Question:

How would some of the problems you anticipate be different if you compared short-term verses long-term use?

Temporal Dimension

- What problems do you anticipate this after a few days of use?
- What different problems do you anticipate after a few months of use compared to just a few days?
- As a designer how would you address prolonged use and the different problems that you anticipate occurring over time?
- How might the end user interact with the technology differently in the long-term versus short-term?
    - Why do you think this is different?
    - Why do you anticipate this?
    - Why do you consider this to be an aspect of good design?

Lead-in Question:

How do you anticipate this technology being used in ways that it was not intended?

Unintended use

- What different problems do you anticipate if this technology was used in a way that it was not intended?

  If this technology was used in a way that it was not intended, what concerns do you anticipate?

Anticipated Covert Categories:

Concerns about opportunities or challenges	Privacy
Efficacy (The right thing to do)	Security
Efficiency (The right way to do something)	Context
Vulnerable/sensitive user groups	Creativity
Privacy/security (Creepy or Invasive)	Competing values
Well-being (Physical, Emotional)	Evaluation criterion
Happiness, Flourishing	Ethical constructs
Profit	User goals and needs
Stakeholder goals	Orders of design
Ownership	Positive and negative experiences
Consent	Values
Trust	
Autonomy	

Concluding Remarks (3 min)

Thank you so much for your time. Do you have any additional things regarding these technologies that I have not asked about directly, but you feel might be relevant?

Are there people you would recommend for this study? The inclusion criteria are:1-3 years' experience, currently employed at the junior-level.

COVERT COTEGORY QUESTIONS

To be explored when led by participants.

Efficiency Vs Effectiveness

- Why would you use [Efficiency or effectiveness] to consider whether something is a good design?
- Is there ever a situation where you might need to compromise [efficiency or effectiveness] for something else?
- What different situations might you anticipate where the [efficiency or effectiveness] of the technology is a concern?
- What are different instances where users may not get the efficiency they'd expect out of this app?

Vulnerable/Sensitive user groups:

- What would it mean for you as a designer to care for vulnerable and sensitive users?
- What different situation can you anticipate where problems might arise for vulnerable/sensitive users?
- How might the needs of vulnerable users compare to the needs of a typical user?
- If you were designing for this user group, how would you seek to meet their needs?
- Can you imagine a situation where this app may end up causing the user harm?

Security, Privacy, Trust:

- If you were designing for this technology, how would you seek to promote [security, privacy, and/or trust]?
- How would you know what promotes [security, privacy, and/or trust] for the end user?
- Are there atypical contexts where different problems related to security or trust might arise?
- Can you think of a situation in which this app may compromise a sense of [Security, Privacy, Trust] for something else? How would you as a design address that?

Well-being (physical + mental):

- How would you as a designer ensure the well-being of users when designing for this application?
- Can you think of a situation in which this app places a user's well-being is at risk?
- What would it mean for you as a designer to ensure an end user's well-being?
- How might the well-being of typical users be different from atypical users?

Other:

- How would you as a designer seek to promote [insert value] in this application?
- How might this technology violate [insert value]? What might place it at risk?
- What are some instances where users' needs associated with [insert value] are not met by this application?
- What situations do you foresee where [insert value] might be at risk?
- When might promoting [insert value] be a conflict of interest?
- What might you need to consider about [insert value] to design for the end user?
- Is [insert list of values] enough for something to be considered a good design?
    - What other consideration might you need to account for?

APPENDIX C. RECRUITMENT MESSAGE

Hi, my name is Joseph Price, I'm currently conducting interviews for my Master's Thesis in the Computer Graphics Technology department at Purdue University. My research is seeking to understand how designers anticipate problems and design responsibly. The perspective that UX designers bring to this study is highly unique and valued.

As a participant, you will be asked to familiarize yourself with documentation that provides a conceptual understanding of specific technology. The interview itself will take approximately 1 hour and will be centered around evaluating this technology from your professional perspective. Interviews will be conducted remotely through Skype. If you are interested in participating, I ask that you'd be currently employed as a user-experience design professional at the junior-level and that you have at least 1-3 years of experience.

To enroll in this study, please participate in the following google form: https://goo.gl/forms/omPF57F9cGejxB6j2

Within one week after enrolling in this study I will send an email asking you to schedule a date and time for the interview that best fits your schedule.

Participation in this interview is voluntary. If you wish to discontinue your participation, you may contact the researcher at price43@purdue.edu

Thank you.

Joseph Price, Graduate Student
Purdue University
price43@purdue.edu

APPENDIX D. INTERVIEW SCHEDULING MESSAGE

Dear [Participant],

My name is Joe Price, and I am a Master's student in the Computer Graphics Technology department at Purdue University. For my master's thesis, I am seeking to understand how designers anticipate challenges and design responsibly. Thank you for your interest in participating in this pilot study. I really value your perspective and contribution to my work. I would like to schedule a time for us to conduct an interview through Skype. The interview should take about 60 min to conduct. Below is a series of next steps.

Please schedule a time by participating in the following doodle poll with me: https://doodle.com/poll/mbr6yf6agb886m49

If Skype is currently not on your computer, please secure a free download here: https://www.skype.com/

Attached to this email is a documentation that you will use to gain a conceptual understanding of the technology we will be evaluating. It is important that you take the time to review and become familiar with this documentation prior to our interview in order to conduct a proper evaluation.

My Skype username is **joeprice43.** Please feel free to contact me at this email with any questions.

Thanks,

Joe Price