


The  
**Human-Centered  
Designer**  **and the**  
**Cognitive  
Dissonance  
Theory**

Navigating contradiction to understanding people  
and the mental motivations that drive behavior.

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**Abstract**

This thesis will explore how the Theory of Cognitive Dissonance provides an improved competency for designers to understand the people they design for and the impact solutions have on communities. To do so, this thesis explains; components of the Theory of Cognitive Dissonance, identifies scientific experimentation, utilization in design, provides tools and methods for the application of the Theory to Human-Centered Design practice, and exemplifies Cognitive Dissonance Theory based intervention in a case study. The result of developing competencies in Cognitive Dissonance Theory is the ability to assess qualitative data that allows designers to understand the deeper mental drivers of human behavior and make predictions of how design solutions may impact the community, all rooted in evidence-based theory. This thesis not only allows designers to adopt a new competency for understanding people and their motivations but can act as a conduit for the adoption of other psychology based competencies to Human-Centered Design as a discipline. By doing so designers understand people on a deeper level making their work truly human-centered.

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**Keywords** Human-Centered Design, Cognitive Dissonance Theory, empathy, cognition, psychology, Leon Festinger, attitude, belief, behavior, social norms.

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# Abstract

This thesis will explore how the Theory of Cognitive Dissonance provides an improved competency for designers to understand the people they design for and the impact solutions have on communities. To do so, this thesis explains; components of the Theory of Cognitive Dissonance, identifies scientific experimentation, utilization of Cognitive Dissonance Theory in design, provides tools and methods for the application of the Theory to Human-Centered Design practice, and exemplifies Cognitive Dissonance Theory based intervention in a case study. The result of developing competencies in Cognitive Dissonance Theory is the ability to assess qualitative data that allows designers to understand the deeper mental drivers of human behavior and make predictions of how design solutions may impact the community, all rooted in evidence-based theory. This thesis not only allows designers to adopt a new competency for understanding people and their motivations but can act as a conduit for the adoption of other psychology based competencies to Human-Centered Design as a discipline. By doing so designers understand people on a deeper level making their work truly human-centered.

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With love and gratitude,  
Tito

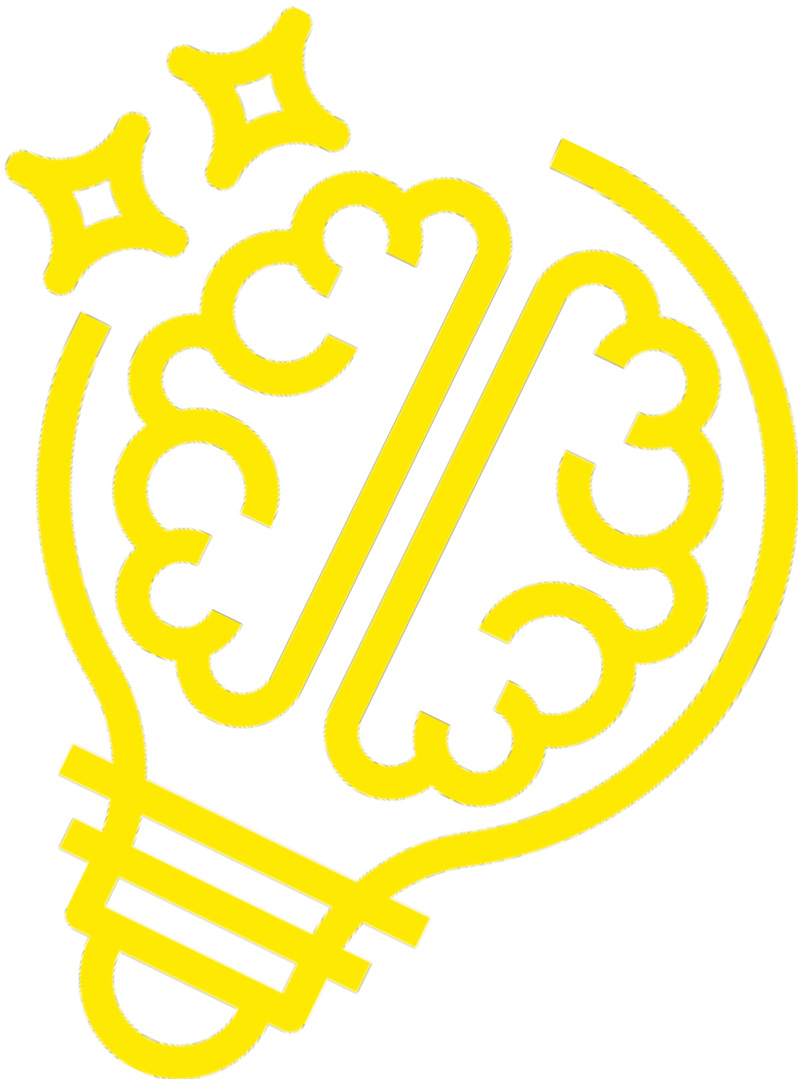
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# Introduction

This thesis is intended for designers, industrial, product and service designers practicing Human-Centered Design (HCD) specifically, and these designers practicing HCD working in development, public health or social wellbeing especially. This thesis is for designers interested in Human-Centered Design, psychology or expanding their competencies as a designer.

For those readers who are designers, take a moment to think about the core competencies that drive the discipline of design.



How much of a designer's work requires an understanding of people? How does a designer's core competencies prepare them to understand people?

We as designers claim to understand people when we apply Human-Centered Design thinking to approach challenges from the perspective of those who our designs are intended to benefit. While my education has been invaluable to myself and effective for the communities I have had the privilege to serve, I believe the discipline lacks a significant anchor for its claims toward understanding people. This untethered line often leaves designers dependent on assumptions, biases, and intuition to buttress reasonings for our solutions.

In my undergraduate education (Bachelor of Science in Industrial Design from the University of the Arts) I was taught to understand people through ethnographic methods and human factors. I was taught to use the qualitative data I gathered from observation, interviews, prototyping, and testing to inform my ways of reasoning about those I was designing for. I was told, "Think from a place of empathy, try to walk a mile in the user's shoes". In my graduate education (Masters of Arts in Collaborative and Industrial Design from Aalto University) I was taught to collaborate with the community so as not to simply design for a community, but with them. In some cases, even acting as only the facilitator for the community to design a solution for themselves.

Universities like Rhode Island School of Design (RISDI), Royal College of Art (RCA), and Aalto University are among the top-rated schools in the world to gain an education in industrial, product or service design. These and other schools are thought leaders and contributors to the academic foundation of design as a discipline.

These great universities produce exceptional talent. Their master's curriculum for design, whether it be Industrial Design (RISDI), Collaborative and Industrial Design (Aalto University), or product, healthcare, or service design (RCA) share many commonalities. The 2020 curriculum programs of these universities offer, studio courses, shop classes (wood, metal, etc.), design research methods, modeling, prototyping, futures thinking, strategic design, entrepreneurship, design history, communications, ethnography, and design theory, as the fundamental competencies of each program. All promise skill development to understand people in one way or another and yet all lack one significant competency, without it, how can we call ourselves designers, much less Human-Centered Designers.

Where is the formal competency for understanding the mental motivation that drives human behavior in Human-Centered Design?





# 1. Human-Centered Design and the Contradictions of People

The topic of this thesis emerged from a late-night cafe conversation with a friend about why do we as people say and do things that are against our own expressed interests. Why is it so hard to do the things we really want? Why do we want things that hurt or cause stress (physically, emotionally, etc.)? Why do we do things we don't want, with no obvious benefit? This conversation led to know answers but permeated my curiosity.

Soon after, I joined Scope Impact (Formally M4ID) during the fall of 2019 where I became a service designer to a project called Core Kenya. This project explored the attitudes, behaviors and social norms around family planning in Kenya. I will delve deeper into this project as part of the case study later in this thesis. My transplant into the Core Kenya project occurred as the team was fresh from field research and beginning synthesis and analysis of collected qualitative data. As synthesis and analysis began our team encountered that familiar phenomenon I had discussed in a cafe just a few weeks prior, and a phenomenon designers face when designing for people frequently. In Core Kenya's qualitative data, people seemed to be in states where their attitudes were in conflict, with their behavior and the social norms they live within. These conflicts existed around behaviors and norms which had adverse, mental, physical, social, and financial effects.

But why? Why do people do things which seem to be against their own desires? Even when family, friends, parents, authority figures, governments, health organizations, and other outside forces offer non-aversive pathways, people still reject, evade, and deny what seems like a more beneficial or logical pathway. Why? This question is the impetus of this thesis.

People are complex. A spectrum of emotions, biases, doubts, intuition, instinct and thousands of other variables, drives this complexity at an individual level. As the number of individuals increase within a given context, complexity for the individual increases exponentially. Society is the exponent to the complexities of an individual. It is this complexity that makes designing for systemic social challenges exceptionally difficult.

The Human-Centered Design (HCD) process has risen as a recognized, beneficial and at times critical practice to see problems in society as opportunities for positive social impact. HCD places people at the center of the design process, making the people designers look to aid, collaborators to the challenge designers wish to overcome. Human-centered Design recognizes people are the experts to their own experience.

While people know their personal experiences and communities best through their lived experience, people are full of contradictions that they themselves are not conscious of. Harmful beliefs, attitudes, behaviors and social norms are upheld by the very individuals which reap this harm. Designers face these contradictions when working with communities throughout the HCD process. This makes designing for overcoming social challenges exceptionally difficult.

Within its principal competencies HCD employs; mindsets, born from empathy and open-mindedness, skills, like research methods, prototyping,

and creative visualization, and knowledge of design methodologies, tools, and ethics. Designers use a vast toolbox of competencies to understand, create, and implement interventions to challenges. HCD does not exist without the community and its people. Yet, the practice often neglects what the field of psychology can contribute to HCD and the people it serves.

Designers use abductive (best prediction based on partial observations) and inductive (general conclusion based on a specific observation) reasoning to make sense of the vast information their competencies excavate in order to understand the people they design for. However, abductive and inductive reasoning vary from designer to designer, biases and personal experience can influence a designer's mode of reasoning. The combination of abductive and inductive reasoning, biases and personal experience are like fingerprints, everyone's combination is unique. These unique perspectives have made the discipline highly effective in designing with people, for people. And still, there is a vacuum in design competencies for understanding people on a psychological level. Designers practicing HCD must begin to understand the psychological dynamics of people. How can designers claim to understand and design for people if their competencies do not include scientifically substantiated dynamics of human thought and behavior.

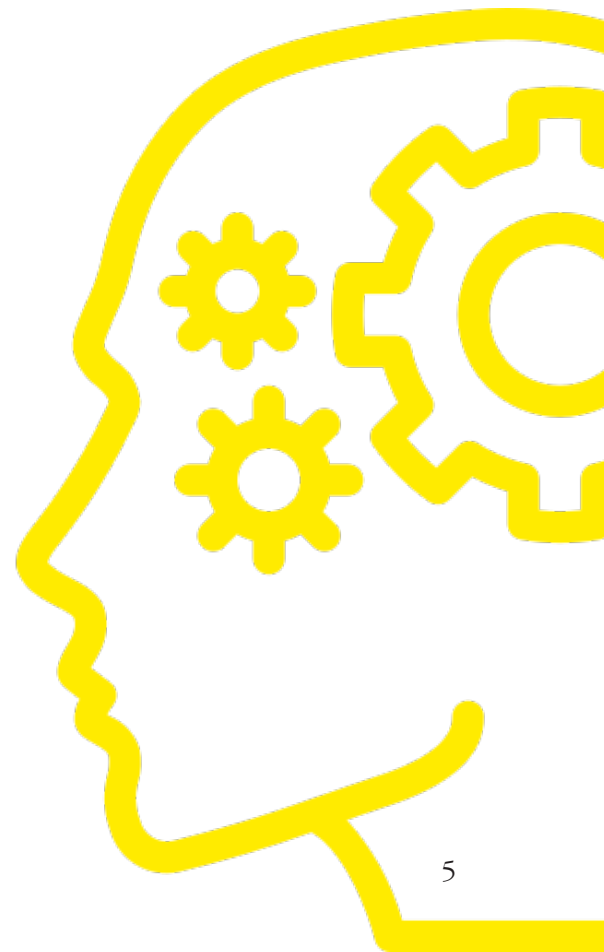
Understanding theories of psychology has the potential to provide designers with invaluable tools for understanding people. By understanding human drivers from a psychological perspective supported by years of scientific study, designers can better communicate how social interventions address complex social problems. This brings greater credibility when HCD solutions meet the highly evidence-driven fields of public health, business, and government.

## **2. Human-Centered Design and Cognitive Dissonance Theory**

“A man (or woman) with a conviction is a hard man to change. Tell him you disagree, and he turns away. Show him facts or figures and he questions your sources. Appeal to logic and he fails to see your point (Festinger, 1957, p3).” If designers want to understand what drives people I believe the discipline must understand contradiction. Designers are often looking to affect behaviors or mindsets of communities that seem to contradict the community's own best interest and wellbeing. If Designers need to make sense of human contradiction, then they must begin with the father of cognitive dissonance, Leon Festinger.

This thesis will explore how understanding the Theory of Cognitive Dissonance provides a new competency for designers to understand the people they design for and the impact solutions have on communities. Designers will be able to do this by better understanding of why people do what they do and better predict how the community may react to design solutions. Cognitive Dissonance Theory (CDT) offers an anchor to moments where individuals or communities seem to act irrationally against their own interest for which current HCD competencies often have no explanation for why.

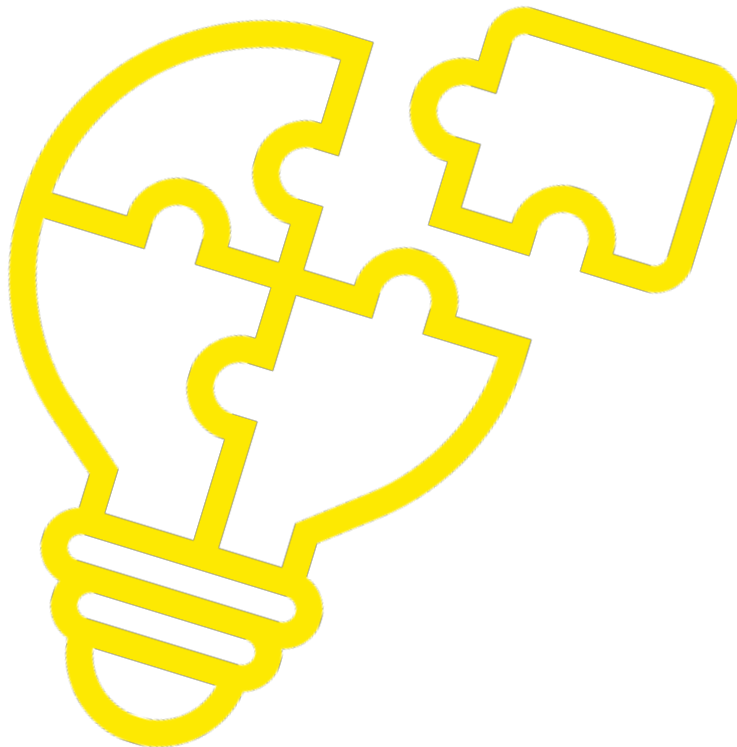
Being able to communicate seemingly irrational and abstract beliefs, attitudes, behaviors, and social norms through evidence-based deduction (alongside HCD's more emotional and intuitive logics), funders, clients, partners, and the community's acceptance and adoption of a solution is more likely. When a solution properly navigates this complex landscape of contradictory human thought and behavior, designers can bolster the effectiveness of their solutions toward meeting people's holistic needs.



# Understanding Cognitive Dissonance

I have introduced the inspiration behind this thesis and outlines Human-Centered Design's need to adopt new competencies in psychology. Such an acquisition strengthens practitioners of the discipline, allowing designers to use evidence-based theory to understand the psychological drivers of people.

As practitioners of HCD, we designers encounter contradictions among the people we design for. Current design competencies lack evidence-based theory to explain the contradictory states which motivate human behavior. To do so, I suggest we designers adopt competencies from the Theory of Cognitive Dissonance. Later in this thesis, I will detail how designers can apply CDT as a supportive competency. However, in the following section I will; detail what is CDT, define and clarify terms, explain CDT elements of cognition, cognitive states, regulation and reduction, paradigms of CDT, and exemplify real world scenarios of CDT.



### 3. What is The Theory of Cognitive Dissonance?

CDT “suggests that cognitive inconsistency leads to a motivational state that promotes regulation, which comes mainly through a change of opinions or behaviors. Many investigations of this theory have relied on the inconsistency between attitudes and behaviors, usually resulting in an attitude shift toward more consistency with the behaviors (Vaidis and Bran, 2019. p1)”. It is important to distinguish the phenomenon of Cognitive Dissonance Theory from the experience of a cognitive dissonance state (dissonance state or state of dissonance). Festinger says cognitive dissonance states are about inconsistent thoughts (Festinger, 1957). He further says, “The existence of [a dissonance state], being psychologically uncomfortable, will motivate the person to try to reduce the [dissonance state] and achieve [a consonance state] (Festinger, 1957, p3).” When two thoughts are in contradiction with one another in the mind of an individual, CDT suggests, the individual feels mental and physical discomfort as the mind craves consonance, also referred to as, consistency. CDT also suggests, that consistency is a natural driver to the mind, this drive for consistency is akin to the body’s hunger for food or thirst for water. The discomfort felt as a result of a dissonance state is the mind’s warning signal to inconsistent thoughts and the mind attempts to achieve a consonance state (or state of consistency) or at the very least reduce the discomfort brought on by inconsistency (See dissonance magnitude and reduction).

A dissonance state is induced in a number of ways, Festinger explains:

- “1. [A dissonance state] could arise from logical inconsistency. If a person believed that man will reach the moon in the near future and also believed that man will not be able to build a device that can leave the atmosphere of the earth, these two cognitions are dissonant with one another.
2. [A dissonance state] could arise because of cultural mores. If a person at a formal dinner uses his hands to pick up a recalcitrant chicken bone, the knowledge of what is doing is dissonance with the knowledge of formal dinner etiquette [in western culture]. The dissonance exists simply because the culture defines what is consonant and what is not. In some other cultures, these two cognitions might not be dissonant at all.
3. [A dissonance state] may arise because one specific opinion is sometimes included, by definition in a more general opinion. Thus, if a person is a Democrat but in a given election prefers the republican candidate, the cognitive elements corresponding to these two sets of opinions are dissonant with each other because “being a Democrat” includes, as part of the concept, favoring Democrats candidates.
4. [A dissonance state] may arise because of past experience. If a person were standing in the rain and yet could see no evidence that he was getting wet, these two cognitions are dissonant with one another because he knows from experience that getting wet follows from being in the rain.”

(Festinger, 1957, p14)

Perhaps the most common and familiar way a dissonance state develops is “new events may happen or new information may become known to a person, creating at least a momentary dissonance [state] with existing knowledge or opinion concerning behavior. Since a person does not have complete and perfect control over the information that reaches him and over elements that happen in his environment, such dissonance [states] they easily arise (Festinger, 1957, p3)”. Festinger goes onto clarify “even in the absence of new, unforeseen events or information, the existence of [a dissonance state] is undoubtedly an everyday condition. Very few things are all black or all white; very few situations are clear-cut enough so that opinions or behaviors are to some extent a mixture of contradictions. [...] Where an opinion must be formed or a decision taken, some dissonance is always unavoidably created between the cognition of the action taken and those opinions or knowledges which tend to point to a different action (Festinger, 1957, p4).”

If this is true how are people not paralyzed by the constant states of dissonance they feel every moment of the day? The theory hypothesizes two behaviors. One, when an individual feel psychological discomfort due to the development of a dissonance state, the state “will motivate the person to try and reduce [the dissonance state] and achieve [a consonance state] (Festinger, 1957, p3).” Second, “when dissonance is present, in addition to trying to reduce it the person will actively avoid situations and information which would likely increase dissonance (Festinger, 1957, p3).” This is a way to regulate a dissonance state, that is, manage the effects of a dissonant element in order to maintain a functional level of consonance.

In order to analyze and strategize for cognitive dissonance states, designers must understand the dynamics of CDT. I will outline how CDT, defines cognition, magnitude, regulation, and reduction of a dissonance state, and recognizes existing paradigms.

### 3.1. Clarifying Terminology

Before I begin to further expand upon the components of CDT I must clarify a key discrepancy in terminology. “As one of the rare social psychology theories that propose a general pattern characterizing the human psyche and construction of reality, CDT [Cognitive Dissonance Theory] is a very important theory for the field (Vaidis and Bran, 2019, p2).” While there is compelling evidence for the CDT, it is not without its flaws. CDT faces two critical limitations, the first is in its terminology. The second is a proposed mechanism for detecting when an individual is experiencing cognitive dissonance or what Festinger refers to as regulation. Later in the thesis, I will expound on Festinger’s points on regulation and how it has evolved.

In this section, I will discuss the issue of terminology. David C. Vaidis and Alexandre Bran explain the following, “the term dissonance to refer to three different entities: the theory itself, the triggering situation and the generated state.” This creates an ionic inconsistency in how the theory is understood.

The term cognitive dissonance is used to describe the theory and the effect. Vaidis and Bran calls “the trigger inconsistency, the evoked arousal a cognitive dissonance state (CDS) and the theory of Cognitive Dissonance Theory (CDT) (Vaidis and Bran, 2019, p2).” To summarize, Vaidis and Bran use the following terms to differentiate, when speaking about Cognitive Dissonance as a Theory and as a state.

**Cognitive Dissonance Theory** - The theory of cognitive dissonance

**Cognitive dissonance State** - The state of mental and physical discomfort brought on by two or more cognitions.

This thesis will use Vaidis and Bran’s terms of Cognitive Dissonance Theory and cognitive dissonance state to make the distinction between the Theory and “a motivational state that promotes regulation (Vaidis and Bran, 2019, p1)”.

## 4. What are Attitudes/Beliefs, Behaviors, and Social Norms

A cognition is any knowledge, opinion or belief about the environment, about oneself or about ones behavior (Festinger, Leon. (1957, p3)”. Festinger explains “elements of cognition [thought/thinking] are representative of reality. This reality may be physical, social or psychological, but in any case, the cognition more or less maps it (Festinger, Leon. 1957. p10)”. Cognition is how people process our reality. CDT segments this reality into three key elements. The relationship between the attitudinal, behavioral, and social elements of the mind is what Festinger analyzes in CDT.

Festinger uses the behavior of smoking to exemplify CDT dynamics. As I explain the dynamics of CDT I too will set these dynamics around the behavior of smoking as an anchor to an everyday situation.

### **Attitudes/Beliefs**

To paraphrase Festinger, thoughts relate to one’s perception of themselves and the reality of their personal experiences. In other words, ‘what I think about myself and my personal experiences.’ An example of an Attitude/belief might be ‘I enjoy smoking.’

### **Behavior**

Festinger defines cognitions of behavior as thoughts related to one’s perceived actions. Put simply, ‘what I think I do.’ An example of an Attitude/belief might be ‘I smoke.’

### **Social Norms**

Festinger defines social norms as cognitions related to one’s perception of the collective thoughts and behaviors of a group, community or society. In other words, ‘what I think everyone else is doing and what they expect me to do.’ An example of social norms might be ‘all my friends smoke.’

It is important to note “social norms” do not strictly refer to all society. Social norms reference, all varieties of social interaction between a subject and their interactions with one or more people, directly or indirectly. It

includes sub-communities an individual may engage with. Peer groups and family, for example, have social norms exclusive to the sub-community and intersect with the social norms of the wider community.

Social norms and beliefs have significant overlap after all the beliefs and behavior of others make up the social norms of an individual. A strong argument could be made that many beliefs come from the social norms of one's environment. So how to distinguish one from the other? I will make the distinction that beliefs are defined as thoughts toward oneself or the perception of oneself. While social norms are what an individual perceives others to commonly think and behave.

Festinger explains, "The reality which impinges on a person will exert pressures in the direction of bringing the appropriate cognitive elements into correspondence with that reality" (Festinger, 1957. p11). In other words, one's social environment has an imperative impact on consonance and dissonance within an individual. If designers ignore the effect social norms can impose on the acceptance or rejection of a design solution then they are playing a game of darts in the dark with their solution, hoping to hit a bullseye.

## 5. Cognitive States

As previously stated, CDT "suggests that cognitive inconsistency leads to a motivational state that promotes regulation, which comes mainly through a change of opinions or behaviors (Vaidis and Bran, 2019, p2)".

But what does it mean to be consistent or inconsistent? Think of inconsistency as two cognitions that oppose each other. In the world of CDT, similar thoughts are attracted to one another are defined as a consistent or consonance state. Dissimilar thoughts repulse each other. These cognitions pull in opposite directions. It is these instances of opposing cognition that generate the 'motivational state that promotes regulation' known as a dissonance state. But, what does cognitive consistency and inconsistency look like? Restated, what do consonance and dissonance states look like? I will use the example of smoking to exemplify consonant and dissonant states. In each example, I will use fictional characters, Micheal and Heather. Each character is in a situation that illustrates one of the two aforementioned cognitive states.

### 5.1. Cognitive States: Consonance

In this example the character Micheal has the following cognitions;

"I do not smoke. I am afraid of developing cancer and I know smoking is a leading cause of cancer. None of my peers are smokers."

In this example, Michael's attitudes/beliefs, behavior, and social norms are all consonant with one another. This means none of Michael's cognitions are in contradiction or dissonance. Michael's cognitions are all relevant to one another as he links them to the topic of smoking. Michael's fear of developing cancer and knowledge that smoking causes cancer is in harmony



with his behavior to not smoke. His peer group are also non-smokers and so CDT predicts Micheal exists within a consonance state where he does not smoke. Within this limited example, Micheal is unlikely to become a smoker as picking up the behavior would cause dissonance states between his attitudes/beliefs and social norm with his new behavior of smoking.

It is important to note consonance states can exist for any relevant and complimentary cognitions. Consonance states do not equate to a “healthy” attitude/belief, behavior, or social norm. Consonance can exist for harmful cognitions, even if that cognition is harmful to the individual with the cognition. Imagine if Micheal in this example is a smoker in a consonant state. Festinger gives examples of how a smoker exists in a consonant state. Festinger says this individual would continue to smoke “knowing that it is bad for his health, he may also feel (a) he enjoys smoking so much it is worth it; (b) the chances of his health suffering are not as serious as some would make out; (c) he can’t avoid every possible dangerous contingency and still live; and (d) perhaps even if he stopped smoking he would put on weight which is equally as bad for his health. So, continuing to smoke is, after all, consistent with his ideas about smoking (Festinger, Leon. (1957, p2). “ As long as the cognitions are in harmony the individual is in a state of consonance, or closer to it, no matter how positive or negative the effects of the cognition may have.

## 5.2. Cognitive States: Dissonance

In this example, the fictional persona Heather, illustrates a dissonance state through the following cognitions;

“I smoke. I am afraid of developing cancer and I know smoking is a leading cause of cancer. Of my peer group, I am the only smoker.”

In this example, Heather’s behavior is dissonant or inconsistent with her attitudes/beliefs and social norms. CDT would suggest Heather experiences mental and possibly physical discomfort due to the result of what Festinger refers to as logical inconsistency and cultural mores. Heather’s behavior to smoke contradicts her fear of potentially developing cancer and knowing her behavior is the leading cause of developing what she fears. Additionally, her behavior puts her in opposition to her peer’s behavior as well.

CDT within the limited example predicts that heather is more likely to look to reduce or regulate her cognitions to approach consonance. To do this she might quit smoking, achieving the same consonance state as Micheal. Heather may find peers who smoke, she may tell herself she otherwise lives a healthy lifestyle and therefore offsets the negative health effects smoking may bring. Later in the thesis, I will go into further detail about how one reduces or regulates a dissonance state.

Heather is an example to showcase a simplified dissonance state. In real life, Heather’s dissonance is much more complex. It is well known, simply quitting smoking is not an easy feat, and finding new friends simply to share a love of smoking cigarettes is impractical.

## 6. Magnitude and the Value of a Thought

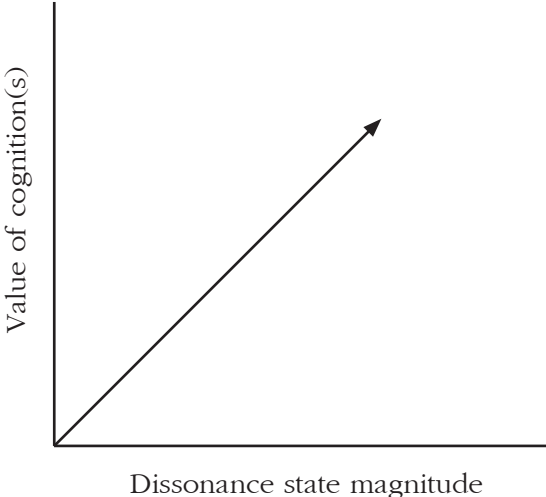
All dissonance states are not created equal. Cognitive dissonance and consonance states have magnitude or levels of intensity. The magnitude of dissonance has no numerical scale at which one could measure. However, Festinger says, “If two elements are dissonant with one another, the magnitude of the dissonance will be a function of the importance of the elements. The more these elements are important to or valued by the person, the greater will be the magnitude of a dissonance relation between them (Festinger, 1957, p16)”. This means the greater the importance or value a cognition holds to an individual or community the greater magnitude (or level of discomfort) is created. This also means the greater value a cognition holds the stronger an individual or community is likely to employ regulation methods to maintain that cognitive consonance.

Because dissonance states have no numerical measure, Festinger classifies cognitions in levels of High, moderate, or low importance. I will use this classification through out this thesis to highlight potential magnitude felt in a situation.

For example, if a stranger asks for 10 cents, and you later find they were not in need will likely causes a dissonance state which has low or otherwise insignificant magnitude as 10 cents in many contexts have low value. In contrast, an example where dissonance state would have a higher magnitude Festinger says, “if a student does not study for a very important examination, knowing that his present fund of information is probably inadequate for the examination. In this case, the elements which are dissonant from each other are more important to the person, and the magnitude of dissonance will be correspondingly greater (Festinger, 1957. p16).”

I will refer to the importance of a cognition as value. Figure 1 illustrates how the value of a cognition increases as the magnitude of a dissonance state is felt by an individual.

**Value of cognition(s) = Magnitude of dissonance state**



**Figure 1: Magnitude graph**

## 7. Dissonance Reduction and Regulation

I have used the terms regulate and reduce to refer to how CDT says individuals address a dissonance state. Regulation and reduction are methods people use to eliminate or tame the mental and physical discomfort brought on by a dissonance state. People regulate and reduce dissonance states often at a subconscious level. If a cognition has low value, reduction or regulation happens instantaneously and the state comes and passes as the individual is unaffected. However, if a cognition has a high value, then when a dissonance state is present it the individual's regulation or reduction methods that become much more evident and an effort is made to regulate or reduce the dissonance state. To the individual, this process is more commonly recognized as rationalizing a situation.

Festinger explains how an individual regulates during a dissonance state. To do this Festinger continues to use smoking as an example, to regulate the smoker, "he might simply change his cognition about his behavior by changing his action; That is, he might stop smoking. If he no longer smokes, then his cognition of what he does will be consistent with the knowledge that smoking is bad for his health. [...] He might change his "knowledge" about the effects of smoking. [...] He might simply end up believing that smoking does not have any deleterious effects or he might acquire so much "knowledge" pointing to the good effects it has that the harmful aspects become negligible. If he can manage to change his knowledge in either of these ways, he will have reduced, or even eliminated, the dissonance between what he does and what he knows" (Festinger, Leon. 1957, p6).

The reduction or elimination of a dissonance state is not always possible. "The hypothetical smoker may find that the process of giving up smoking is too painful for him to endure. He might try to find facts and opinions of others to support the view that smoking is not harmful, but these attempts might fail. He might remain in a situation where he continues to smoke and continues to know that smoking is harmful. If this turns out to be the case, however, his efforts to reduce the dissonance will not cease" (Festinger, Leon. 1957, p6).

Festinger's theory summarizes that we reduce dissonance by one or more of 4 ways.

1 – Change your beliefs

An individual may change their belief to create consistency.

2 – Add new beliefs

An individual may add new beliefs to create consistency.

3 – Change your behavior

An individual may change their behavior to reduce dissonance.

4 – Change your Social norms

Lastly, and most difficult to achieve is changing one's social norms.

I make two additions to this list, that is one could,

5 – Add a new behavior  
An individual may add new behavior to create consistency.

6 – Add a new social norm  
An individual may add a new social norm.

All 6 methods are ways of regulation. However, only by changing the attitude/belief, behavior, social norm causing the CDS can one reduce the effects of the state.

## 7.1 Limitation of Festinger's Original CDT: Regulation and Reduction

Vaidis and Bran clarify Festinger's definition of 'regulation'. Vaidis and Bran suggest clarifying, "the term regulation fits best with the idea of generally decreasing the motivational state, while the term reduction could be reserved for regulation specifically aimed at reducing the inconsistency" (Vaidis and Bran, 2019, p3). In other words,

Regulation - Addresses the individual's drive to lower the effects of mental and physical discomfort.

Reduction - The attempt to resolve inconsistencies.

Think of reduction as directly targeting the cognition which causes the dissonance state, while regulation attempts to cope with the dissonant cognition still existing.

Vaidis and Bran explain, "absence or presence of any given mode of regulation neither confirms nor disconfirms the presence of a cognitive dissonance state. [...] plethora of regulations can occur, including, for instance, trivialization (Simon et al., 1995), denial of responsibility (Gosling et al., 2006)', 'self-affirmation (Steele and Liu, 1983) or even value affirmations (Randles et al., 2015). [...] Hence, a serious assessment of regulation strategies that avoid false negatives would have to include all possibilities. Because it is difficult to predict which strategy will be used, it seems unreliable to postulate the existence of CDS and its magnitude on the sole basis of the use of a regulation strategy" (Vaidis and Bran, 2019, p3). To conclude, "attitude change is only a means of regulation that occurs in specific conditions, but is not a synonym for CDS, nor is any other regulation strategy. Assuming an equivalence between the occurrence of regulation and the existence of a CDS is a logical error and must be avoided" (Vaidis and Bran, 2019, p3). Regulation nor reduction methods cannot be used as the only indicator of a dissonance state existing. While regulation methods can be one potential signifier, one must not use regulation as the sole indicator. To identify a dissonance state I propose one must, (1) be aware of potential regulation or reduction methods at play, (2) Identify conditions which are dissonant with one another, and (3) verify one of the following emotions exist with the subject about the situation; confusion, anger, frustration, anxiety, or disgust. Emotions connected to identify a CDT is a topic that can and should be further explored to more accurately identify a CTS, however, I will not do so in this thesis. These emotions are drawn from participant descriptions during CDT experimentations referenced later in this thesis. I could suspect other

emotions like anger, surprise, disgust, and intrigue can also be indicators of a potential CDS as they can often occur during one of the four ways a CDS is induced outlined earlier in this thesis. Summarized, CDS is induced by inconsistent logic, cultural norms, experience or opinions. No one indicator guarantees a CDS, but the more indicators of a CDS there are, the more likely the CDS exists.

## **8. Paradigms of Cognitive Dissonance Theory**

CDT-based intervention leverages cognitive states for attitudinal also (mindset), behavioral, or social change. These interventions often create a dissonance state in order to guide target groups for a change. Some interventions offer a consonance state to an already existing state of dissonance. There are 5 widely recognized paradigms within the theory (there are others however this thesis will focus on the key 5) identified in the following subsections sections (Sections 8.1 - 8.5).

### **8.1. Forced Compliance**

Forced compliance (Festinger and Carlsmith 1957) also referred to as induced compliance states, a person who is forced or persuaded to publicly justify and advocate for a behavior or belief to which they have not adopted is more likely to adopt the new behavior themselves. Forced compliance often does not lead to an attitudinal change, though it is not impossible. Festinger and colleague Carlsmith explain, “under some conditions, the private opinion changes to bring it into closer correspondence with the overt behavior the person was forced to perform. Specifically, if a person is forced to improvise a speech supporting a point of view with which he disagrees, his private opinion moves toward the position advocated in the speech [...] the person who is forced to improvise a speech convinces himself” (Festinger and Carlsmith 1957, 106). The individual must be forced to comply with the dissonant behavior that the dissonance attitude or belief becomes consonant. To summarize, “participants act contrary to an existing attitude and if provided little reasoning for doing so, are hypothesized to experience dissonance. This dissonance may be reduced by changing future behavior or attitudes” (Freijy and Kothe 2013, 3).

### **8.2. Hypocrisy Paradigm**

Hypocrisy paradigm (Aronson, Fried, & Stone, 1991) involves an individual advocating overtly for behaviors to which they fall short in exhibiting. When this individual is made aware of this contradiction a dissonance state develops and a behavioral change is often the method employed to reduce the magnitude of this dissonance state. Elliot Aronson, Came Fried, and Jeff Stone hypothesized the hypocrisy paradigm stating, “Inducing people to realize they are not practicing what they are preaching cuts off the easy route of denial and forces them to make a more realistic assessment” (Aronson, Fried, & Stone, 1991, p12). However, I would argue, just because an individual points out their hypocrisy this will not ensure behavioral change,

hypocrisy will cause a dissonance state that may or can lead to behavioral change or lead to regulation to maintain the hypocritical cognition (this is likely if the value of the cognition is high). In the real world outside of clinical studies, we see this dynamic becomes significantly more complicated than presented. Yet, we must keep this paradigm in mind. To summarize, “Participants make a pro-social statement about the value of a particular behavior and are then made mindful of their past failures regarding that behavior. The inconsistency between the participant’s present attitudes and past transgressions leads to the arousal of [a dissonance state]. In the paradigm, the primary method of [magnitude] reduction is behavior change rather than attitude change” (Freijy and Kothe 2013, p3).

### **8.3. The Effort Justification**

The effort justification paradigm (Aronson & Mills, 1959) states when an individual perceives their efforts in performing a task as high effort with a perception of low reward, they may begin to create a strong justification for their efforts. This paradigm is also explained as “persons who undergo an unpleasant initiation to become members of a group increase their liking for the group; that is, they find the group more attractive than do persons who become members without going through a severe initiation” (Aronson & Mills, 1959, p Abstract). Aronson & Mill’s use of initiation in this definition is representing effort. For individuals who exert high effort to a goal who’s reward is perceived as negatively proportionate to the amount of effort with developing dissonance, “the dissonance created from this inconsistency may be reduced if participants justify their actions to be worthwhile” (Freijy and Kothe, 2013, p3). This is assuming the individual completes the task. There is a possibility that an individual will simply stop doing the task or perceive the task as high effort with no reward and therefore avoid the dissonance state.

### **8.4. The Free Choice Paradigm**

The free choice paradigm (Brehm, 1956), hypothesizes when an individual is presented with and makes a choice if the result of that choice is not consistent with one’s beliefs, behaviors, and social norms, they will likely develop a dissonance state. “All cognitive elements that favor the unchosen alternative are ‘dissonant’ with the chosen behavior. Furthermore, other things being equal, the greater the number of elements favoring the unchosen alternative (i.e., the greater the relative attractiveness of the unchosen alternative) the greater the resulting [dissonance state]” (Brehm, 1956, 384). This resulting dissonance state causes the individual to reduce magnitude by way of changing or adding to their beliefs with positive beliefs about the selected choice and greater negative beliefs about the choice unchosen. The paradigm further states that “after making the decision, thinking about the positive features of the rejected alternative or the negative features of the chosen alternative arouses [a dissonance state]. This may be reduced if participants view the chosen alternative more positively and the rejected alternative more negatively than they did before their decision” (Freijy and Kothe, 2013. p2).

## 8.5 Belief Disconformation

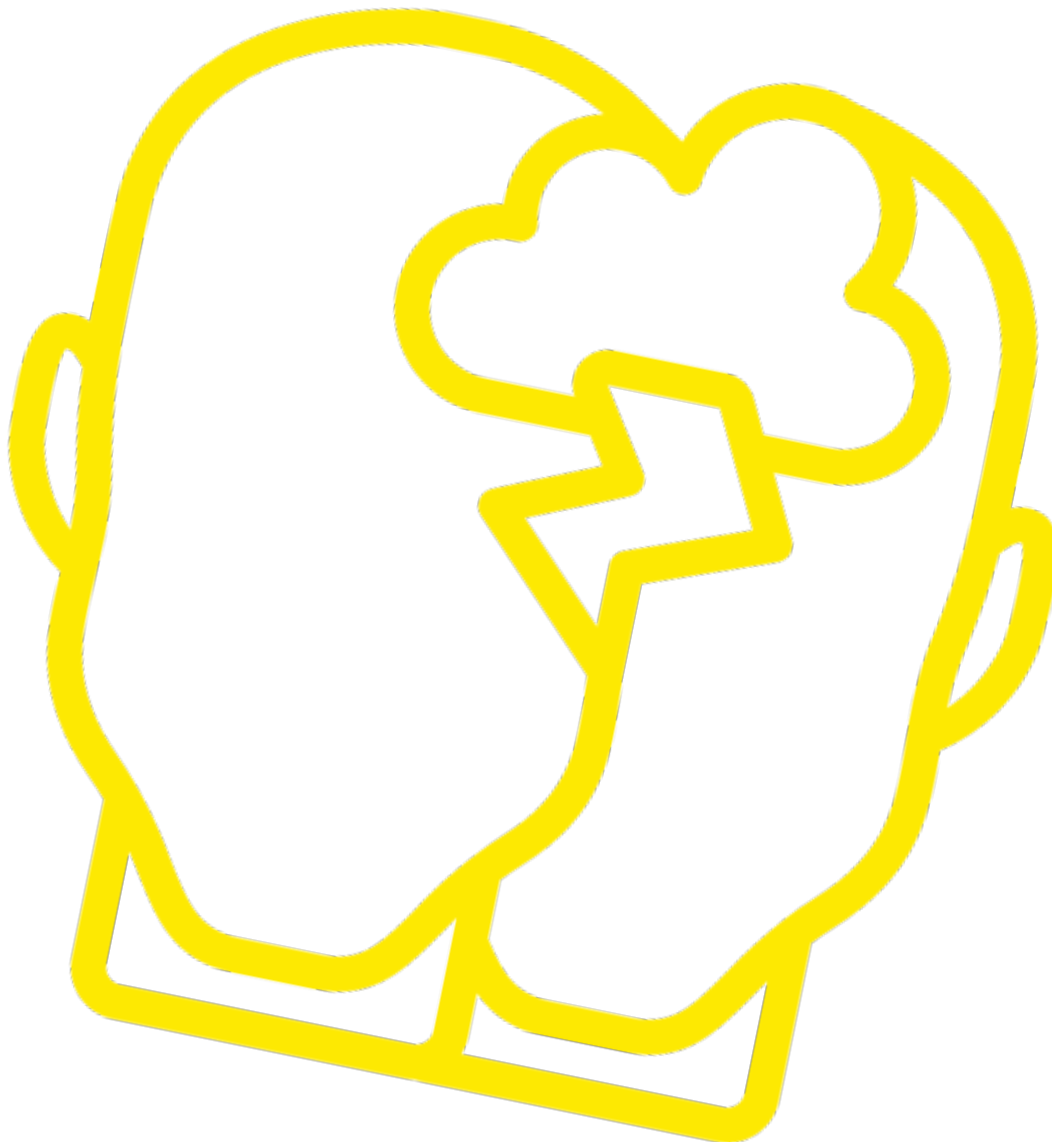
Belief Disconformation states that an individual with strong convictions is likely to firmly hold on to those beliefs when presented with beliefs, behaviors, or social norms contradicting their beliefs. This contradiction is likely to drive them to bolster his belief or find a social norm which is more in line with their belief. “Suppose an individual believes something with his whole heart; suppose further that he has a commitment to this belief, that he has taken irrevocable actions because of it; finally, suppose that he is presented with evidence, unequivocal and undeniable evidence, that his belief is wrong: what will happen? The individual will frequently emerge, not only unshaken but even more, convinced of the truth of his beliefs than ever before. Indeed, he may even show a new fervor about convincing and converting other people to his view (Festinger, Riechen, and Schachter, 1956, p3).” In other words “[A dissonance state] is aroused when participants are provided information inconsistent with their existing beliefs. If unable to change their beliefs, participants may reject or deny the conflicting information, or seek others sharing similar beliefs to restore a state of consistency (Freijy and Kothe, 2013, p2).”

Festinger and his colleagues set 5 conditions for dissonance confirmation to apply. They are quoted as follows:

1. “A belief must be held with deep conviction and it must have some relevance to action, that is, to what the believer does or how he behaves.
2. The person holding the belief must have committed himself to it; that is, for the sake of his belief, he must have taken some important action that is difficult to undo. In general, the more important such actions are, and the more difficult they are to undo, the greater is the individual’s commitment to the belief.
3. The belief must be sufficiently specific and sufficiently concerned with the real world so that events may unequivocally refute the belief.
4. Such undeniable disconfirmatory evidence must occur and must be recognized by the individual holding the belief. The first two of these conditions specify the circumstances that will make the belief resistant to change. The third and fourth conditions together, on the other hand, point to factors that would exert powerful pressure on a believer to discard his belief.
5. The individual believer must have social support. [...] If, however, the believer is a member of a group of convinced persons who can support one another, we would expect the belief to be maintained and the believers to attempt to proselyte or to persuade nonmembers that the belief is correct. These five conditions specify the circumstances under which increased proselytizing would be expected to follow disconformation.”

(Festinger, Riechen, and Schachter, 1956, p4)

Belief disconformation is what we are looking to overcome in many social design interventions, by leveraging one or more of the paradigms we may find systematic strategies for social impact.



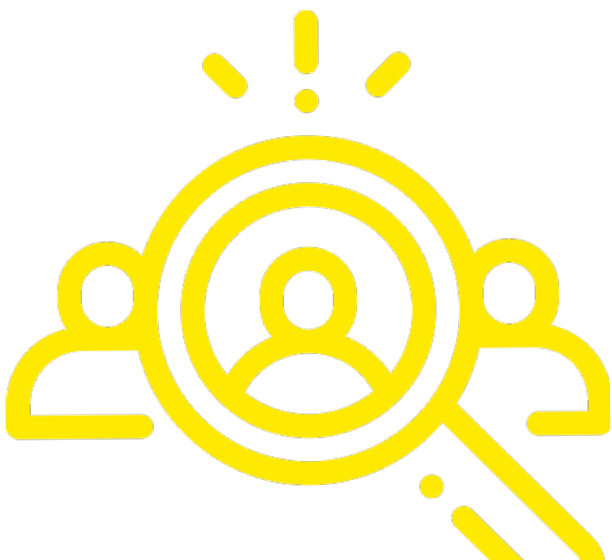


# Applied Cognitive Dissonance

Throughout this thesis, I have outlined the Theory of Cognitive Dissonance, differentiated Dissonance states from the theory itself, defined the terms and concepts of cognitions (beliefs, attitudes, behaviors, and social norms), magnitude, regulation, and reduction, and noted identified paradigms existing under CDT. I will continue to reference the theory, terms, concepts, and paradigms mentioned from the previous sections throughout the duration of this thesis. This has set the foundation for the knowledge needed to understand the dynamics and concepts I will present.

Recall, a key driver for this thesis is to explore how employment of CDT fortifies HCD's legitimacy when meeting the world of public health and global development. HCD simplifies social complexities exceptionally well however, often lacks the ability to root reasonings of simplifications in evidence-based logic. Because of this, HCD while highly effective, is slow to resonate among more rigorous fields.

This section will place the learnings from the previous section in the context of public health and design. I will do so by first sharing how clinical experimentations were conducted to demonstrate the effectiveness of CDT based intervention in public health trials. These experiments will use paradigms of CDT to develop strategies for solving public health challenges. After which I will exemplify cases where designers have learned adopted CDT or other psychology theories for interaction and product design, advertising, and brainstorming of the general design process. Among these cases I will share the methodology behind how the teams used these theories and what value is added for the teams that employ CDT inspired (or adjacent) tools and thinking.



## 9. Cognitive Dissonance States in Public Health Trials

CDT has precedent examples for the intentional and conscious application in some public health initiatives, though not widely used in this way. Programs using cognitive theory-based intervention show themselves in interventions involving, drug use, weight loss, alcohol use, sun protection, and even playground risk behavior. However, I will focus on interventions conducted on sexual risk behavior. Studies show that CDT interventions show promise for effective behavioral intervention.

The results and methods of this clinical trial are important figures to learn from. Later in this thesis, the Core Kenya case study will walk through how the Scope Impact team and I navigated challenges in the sexual risk behavior of men and women. Understanding how public health trials have utilized CDT will aid in the communication of CDT supported design outcomes.

### 9.1. Sexual Risk Behavior

As previously mentioned, during the exploration and development of this thesis, I became apart of the Scope Impact team as a Service Designer. Scope is a social impact company dedicated to accelerating social change. Scope focuses on projects on health, gender and equality, because of this, projects at Scope often address or are effected by sexual risk behavior. Therefore understanding how CDT approaches challenges in clinical trials within sexual risk behavior is an important and relevant precedent to the goals of Core Kenya. Understanding the use of sexual risk behavior will become relevant to the prospective speculation of the Core Kenya case study.

The hypocrisy paradigm based interventions show promise and have tested in the area of sexual risk behavior.

A 1994 study sought to explore the hypocrisy paradigm against denial phenomenon in HIV/AIDs risk behavior (Baker, L. C. 1994). The study included a group of 171 college students divided into 4 groups. The 'high awareness enforcement group' was asked to film a speech advocating for safe sexual behaviors while writing about their past risky sexual behaviors. The 'No endorsement group had the identical task as the 'high awareness endorsement group' excluding filming. A third, 'low awareness endorsement' group only filmed a speech advocating for safe sexual behaviors. The forth, 'low awareness no endorsement' group gave an unfiled speech advocating for safe sex. After a month, the study showed no significant change in the behavior of the participants (it is unclear why, more information is needed but was inaccessible).

However, in 1999 study conducted by authors of the Division of Epidemiology, Statistics and Prevention Research and State University of New York at Stony Brook (Eitel and Friend, 1999) showed greater promise. 80 college students were asked to perform similar tasks in the 1994 study. A hypocrisy group creates a speech and film advocating for condom use while also making clear of their past missed behavior to do so. This slightly differs from the 1994 study. In this 1999 study, participants spoke openly in the film about

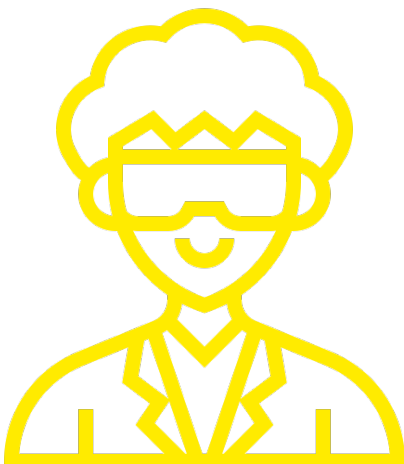
their past shortcomings rather than keep them to themselves. A preach-only group filmed a speech only advocating for condom use, a mindful-only group wrote an unfilled speech, while a control group simply received information about condoms. This study showed a significant positive change in behavior and intention to practice safe sex (based on a group mean) in the hypocrisy group than any other. After a three month follow up, the hypocrisy group reported the highest rate of condom use compared to other groups.

In 2002, another study (Thompson, Kyle, Swan, Craig, & Vrungos. 2002) reviewed by AIDS Education and Prevention, featured 128 participants for “an intervention to increase condom use by undermining perceptions of invulnerability to HIV (Thompson, Kyle, Swan, Craig, & Vrungos. 2002, p505). 128 college students were divided into two groups. The hypocrisy group were asked to write about their risky sexual behavior, make assumptions about the HIV status of photographed people and advocate for safer sex. The control group was asked to watch a video advocating for safe sex practices. The results of this study showed evidence of significant behavioral, attitudinal, and intention changes for positive sexual behavior in the hypocrisy group. After a three month follow up, the hypocrisy group participants reported significantly greater condom use compared to those in the control.

These studies suggest CDT based interventions have power when looking to affect behavioral change. The hypocrisy paradigm in 2 of these three cases proved to be effective in making short term impact on attitudinal and behavioral change. These studies are not without their limitations, while I will not detail those limitations in this thesis, readers can find a systematic review of these studies and many others in Tanya Freijy and Emily Kothe’s article titled, *Dissonance-based interventions for health behavior change: A systematic review*.

As we move from out of the world of controlled studies to the real world CDT interventions become more complex but ripe with opportunity for social impact interventions.

Understanding the effectiveness of studies such as the ones I have outlined in this section will provide designers with knowledge of the effectiveness of CDT interventions in clinical trials. With creative, adaptive, and empathic ways of thinking, Designers can expand the variety and effectiveness of promising experimental interventions. These studies can also provide designers with a blue print for how to create new interventions based in CDT.



## 10. Psychology Inspired Design Methodology and Tools

In the previous section I have given brief examples for CDT based interventions in public health. How have areas of design adopted methods of practice from CDT or other areas of psychology?

In this section I will identify how some designers and companies have been inspired by the field of psychology to better understand their users. These designers and companies cover the areas of interaction and product design, advertising, and brainstorming in the design process.

### 10.1. Dissonance States in UX Design

Digital UX design has precedent to incorporate principles of CDT into how the discipline creates digital experiences. Anton Nikolov uses the example of the Foot-in-the-Door Technique, a technique where a designer guiding users through milestones. Persuading them to download, subscribe, or share for example. “Using the Foot-in-the-Door technique, increases the likelihood of someone doing what you want them to do. It is important not to be too pushy with the asking of favors, because it will send the user flying out of the door. Giving the users time to rest and sort out their thoughts is crucial if you want this technique to work well. Each time you ask the user for a favor with your design, you create a small cognitive dissonance that is proportional to the size of favor. That’s why the product/service flow needs to be designed in a way where the user can have a rest period to resolve the cognitive dissonance by himself. (Nikolov, 2016, uxplanet.org)”.

Nikolov continues on to detail, while techniques like the Foot-in-the-Door are gentle nudges by the designer onto the user. Other techniques that Nikolov describes as a “Not so nice way to use cognitive dissonance” is designed to be unpleasant and generate a dissonance state. He uses the example of pop-ups that are persistent, hard to close but easy to continue, and attempt to make the user feel guilty for exiting the pop-up. While effective, “Designers must avoid creating such manipulative and unethical designs. Even if it helps the conversion rate in the short term, in the long term it creates bad user experience (Nikolov, 2016, uxplanet.org)”.

### 10.2. Design for Dilemma

“Identifying and dealing with the dilemmas that underlie behavior, can be a means to framing real-life problems that cause social and individual suffering” (Ozkaramanli, D. 2017. p13). Much like CDT, the concept of designing for dilemmas addresses conflicting concerns within individuals. Dilemmas occur when individuals must make a decision between two or more options which have opposing benefits and disadvantages. Essentially, designing for dilemmas explains the induction of a dissonance state when a choice is made. “Evidence in psychology literature that supporting people in dealing with their dilemmas has implications for everyday experiences as well as subjective wellbeing. Dilemmas prevail in everyday life, and thus, their management depletes self-regulatory resources (Hoffman, Baumeister, F.rster, & Vohs, 2012. via Ozkaramanli, D. 2017. p13). In addition, being related

to decision-making processes, experiencing dilemmas may have a negative influence on the satisfaction derived from daily choices (a phenomenon called the paradox of choice” (Ozkaramanli, D. 2017, p13). Designing for dilemmas leverages psychological dynamics in decision making in order to guide users to a predetermined outcome of the designer or to induce a conscious and informed decision making in users. Deger Ozkaramanli identifies three types of interventions designers can address dilemmas in product design.

1. “Resolving dilemmas. These interventions aim to redesign existing products, services, or environments in such a way that conflicting concerns can be simultaneously fulfilled.
2. Moderating dilemmas. These interventions aim to help users manage their dilemmas by explicitly prioritizing one concern over the other.
3. Triggering dilemmas. These interventions aim to draw attention to the concerns aroused by the dilemma and thus create awareness about the dilemma itself, without necessarily fulfilling any one of these concerns.”

(Ozkaramanli, D., 2017, p32).

With significant overlap, one could replace ‘dilemmas’ in the three intervention types listed above with “dissonance state” and the two become synonyms of one another as the outcome remains the same. Figure 2 exemplifies products that resolve, moderate or trigger dilemmas In figure 3 Ozkaramanli has mapped ways in which a design can resolve, trigger, or moderate, a dilemma. More on this can be found in *Me against myself Addressing personal dilemmas through design* by Deger Ozkaramanli. I will create a tool inspired by Ozkaramanli’s thinking and revisit some of these methods for addressing dilemmas in the coming case study.



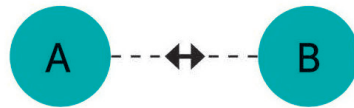


Figure 2: “Collage of existing products that can address dilemmas through acting on conflicting concerns” (Source: Ozkaramanli, D., 2017, p33)

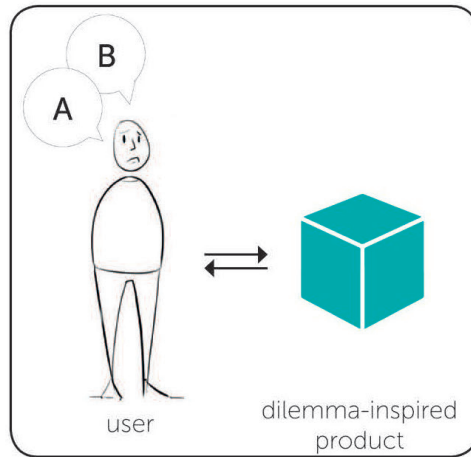
Three main design directions to address dilemmas and supporting design strategies. Blue color indicates which concerns the designer chooses to fulfill when creating a dilemma-inspired product

- Blending
- Fixing
- Designing flexibility into the product
- Introducing new designs

### Resolving Dilemmas

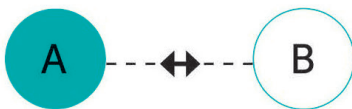


Simultaneously fulfilling conflicting concerns (A & B)



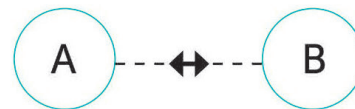
Explicitly prioritizing one concern (A) over the other concern (B)

Exposing the conflict between A&B, and thus, emphasizing the dilemma



### Moderating Dilemmas

- Creating enablers for A or barriers for B
- Adding new sources of pleasure to A or displeasure to B
- Making desirable consequences of A, or undesirable consequences of B, tangible



### Triggering Dilemmas

- Creating embodied symbols
- Creating forced choices
- Creating behavior barriers

Figure 3: “Three main design direction to address dilemmas and support design strategies” (Source: Ozkaramanli, D. 2017, p184).

### 10.3. Need Scope

The need scope model taps into the psychological desires or needs of individuals in order to design a brand that speaks to those needs. While not directly linked to CDT, this model draws from psychology to develop design work. The Need Scope Model was discussed during the Core Kenya project as a psychology inspired tool to utilize in design. It was discussed as a benchmark to what I was attempting to do with CDT and design.

The Need Scope Model places emotion at the center of brand experience, “Need scope helps marketers understand and navigate the emotion in brands. It’s based on proven psychological principles. The Jungian concepts of archetypes and the collective unconscious. Need scope uses a framework to unravel a consumer’s conscious and unconscious needs and how brands satisfy these” (Kantar TNS, 2016. tnsglobal.com).

“Marketers alongside creatives and designers use this model to leverage the ecological dynamics of the people they are looking to attract. “Validated projective tools help consumers reveal their subconscious emotive needs. The need scope model help navigate the emotion. It has two underlying dynamics (figure 4) 6 universal emotion symbolized by colors that drive brands choice. The emotions are also expressed through common archetypes (figure 5) and each emotion has different dimensions” (Kantar TNS, 2016. tnsglobal.com).

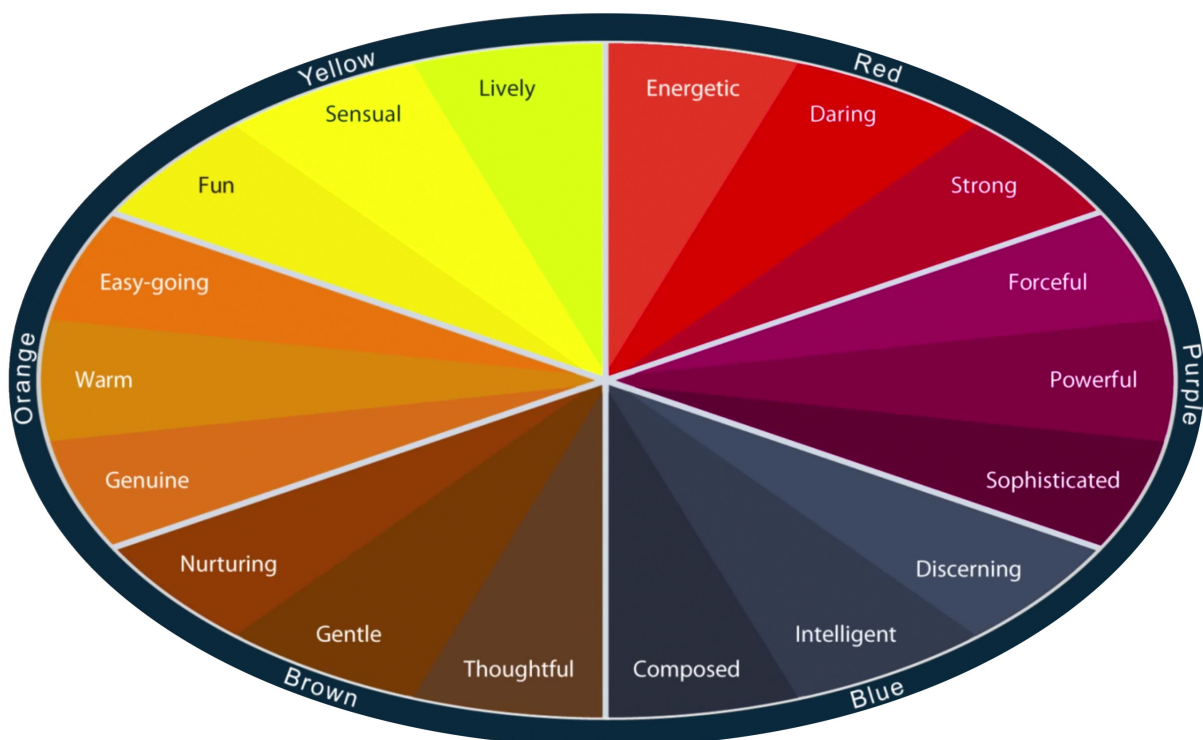


Figure 4: Empathy Map (Source: Kantar TNS, 2016. tnsglobal.com)



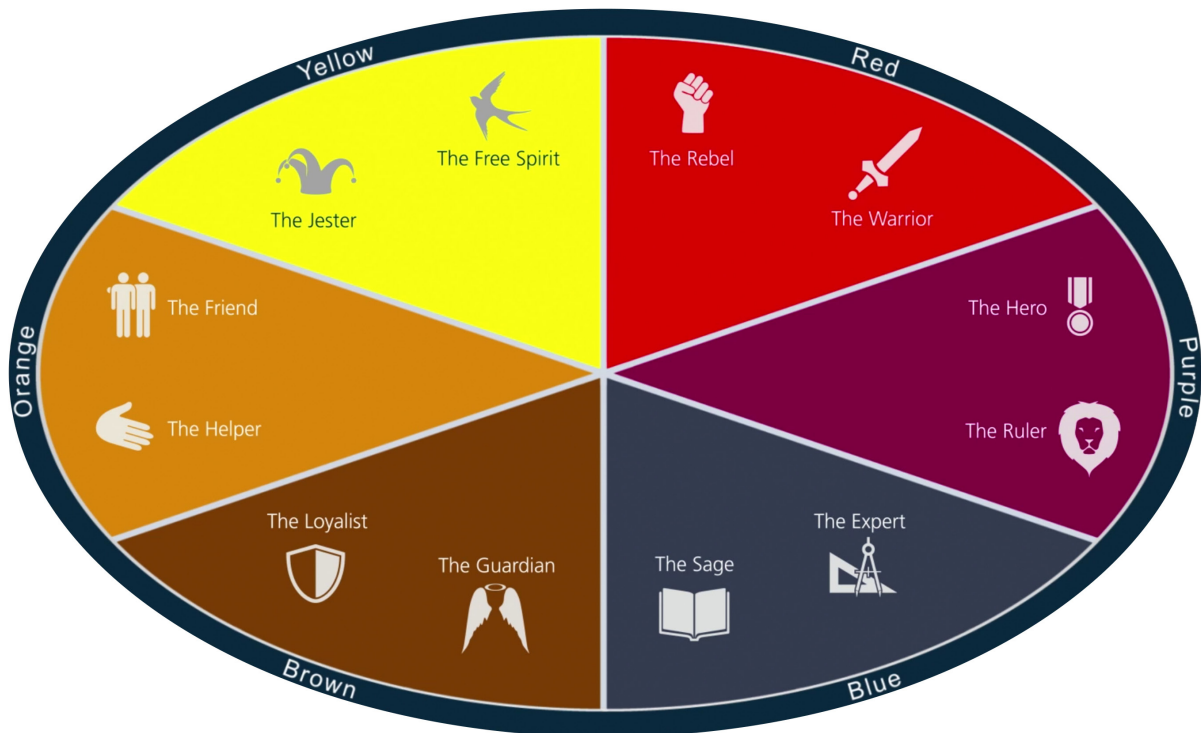


Figure 5: Empathy Map (Source: Kantar TNS, 2016. tnsglobal.com)

This leveraging of psychological theories is what I propose the discipline of HCD needs more of. Need Scope draws from theories of ego and the collective and personal unconscious. In the case study of this thesis, I will detail how discussions about the Need Scope alongside CDT allowed my design team to analyze beyond the physical needs of the people we were designing for and communicate abstract needs and motivations to evidence-driven clients.

## 10.4. Persuasive Patterns

UI-Patterns have created the Persuasive Patterns card deck, they are “60 design patterns driven by psychology, presented in a manner easily referenced and used as a brainstorming tool (UI-patterns.com, 2020). This deck gives high-level insights into psychological concepts like value attribution, optimism bias, positive mimicry, and even, cognitive dissonance. The deck is the kind of tool I look to create to facilitate the use of CDT during the HCD process.

UI patterns is a site focused on “listing different ways of solving common design problems, but also rationalizing about how, when, and why such solutions should be used, it is the goal to create a tool that will help end feature debates, get a clear understanding of why we’re doing what we’re doing, and why we’re not doing what we’re not doing” (UI-patterns.com, 2020).

Creators of persuasive patterns hope those in the field of design, marketing, and strategic planning are able to utilize the concepts shared for strategic

advantage towards their goals. Just as I am suggesting in this thesis, Persuasive Patterns aims for these fields to integrate understanding human behavior from a psychological perspective into the process designers (and others) use to serve people.



Figure 6: Persuasive Patterns (Source: ui-patterns.com, 2020)

## 11. Absent competency for CDT in Human-Centered Design

Adoption of psychology based knowledge of theories like CDT, are not established in the basic competencies of HCD. Once again, I implore designers who are reading this thesis to reflect on their competencies as designers. Especially those who practice HCD. Which of these competency come from or are informed by theories of psychology? More specifically CDT.

In *Characterizing Competencies for Human-Centered Design*, authors Julia Kramer, Alice Merner Agogino, and Celeste Roschuni have mapped Cultivated mindsets, Specialized Disciplinary Skills, Contextualized Tasks, and Basic Skills of HCD competencies. Figure 7 highlights the basic competencies of HCD. While this list includes abductive and inductive reasoning, no listed competency addresses the psychological analysis of people designers perform. More specifically is the question what is the process of a designers abductive and inductive reasoning? What are designers drawing on to turn observation in to conclusion? The answer requires an investigation that exist outside the scope of this thesis. However, CDT (and other theories from psychology) have the ability to support designers abductive and inductive reasoning. In Figure 8 HCD designers' specialized skills, even here designers lack competency for psychology based knowledge or practice. Because of this vacancy, Human-Centered Designers are approaching social, health, and wellbeing challenges of people without a formal anchor to the psychology of people. Because of this, designers can struggle to communicate pathways through their abductive and inductive reasoning in ways which resonate with clients and partners from public health and development. Often times these clients and partners state HCD often jumps from insight to solution without an understood pathway. These clients and partners see the benefit of what the creative side of HCD can bring to approaching challenges. Understanding and utilizing evidence based theories on human psychology will not only assist designers in better explaining and supporting their reasonings, but strengthen how designers, develop insights, and strategize solutions.

Section 11 shares examples of how designers and companies have exploring the use of psychology or CDT to inform strategy and design. The utilization of these approaches remain unique to the companies or designers that developed them. As more Designers adopt learnings from psychology, specifically CDT, designers will need general and flexible tools and methodologies to support their new competency in CDT.



### Basic Skills

We define a basic skill as an underlying essential ability common in HCD. Table 3 shows our list of basic skills for HCD.

**Table 3.** Basic skills for human-centered design

Basic skill	Description
<b>Abductive reasoning</b>	The ability to draw the best possible explanation from a set of observations
<b>Active listening</b>	The ability to listen by fully engaging and using all senses to listen and respond in a conversation
<b>Clarifying</b>	The ability and habit of asking pointed questions and re-stating what has been already heard in order to confirm understanding
<b>Critiquing</b>	The ability to give balanced and useful feedback on others' work in order to promote improvement
<b>Decision making</b>	The ability to employ a systematic and unbiased process to first understand the potential choices and then to choose which choice is best for the given context
<b>Deductive reasoning</b>	The ability to draw a specific and guaranteed conclusion from a set of premises, which are assumed to be true
<b>Defining the problem</b>	The ability to clearly define and recognize the boundaries of the problem being addressed
<b>Delegation</b>	The ability to assign and distribute tasks in a project to others in order to maximize effectiveness and efficiency
<b>Digging deep</b>	The ability to push beyond the obvious and therefore uncover core insights
<b>Drawing</b>	The ability to commit ideas and designs to paper or file by drawing them out, ideally with strong fundamentals in perspective, proportions, and so on
<b>Explaining in simple terms</b>	The ability to break down a complex topic and explain it to the average person on the street, in a company, or someone without a high-level understanding of the field
<b>Facilitating</b>	The ability to facilitate a conversation between multiple parties and guide the conversation so as to keep it on task and topic
<b>Goal setting</b>	The ability to clearly articulate specific and realistic aims for what is to be achieved in a process or project
<b>Identifying core components</b>	The ability to uncover the central aspects or subcomponents of a problem or concept
<b>Identifying key insights</b>	The ability to pull out the most useful revelations from research
<b>Identifying known and unknown</b>	The ability to objectively analyze what is currently known and not known about a specific issue or situation
<b>Identifying obstacles</b>	The ability to foresee and address potential problems that might impede project progress
<b>Identifying patterns</b>	The ability to recognize clusters or commonalities in data or ideas, and extrapolate these commonalities more broadly
<b>Improvising</b>	The ability to react quickly and without other information to a scenario with whatever is available on hand
<b>Inductive reasoning</b>	The ability to take a specific observation and apply it in a more general context, drawing a likely but not guaranteed conclusion
<b>Mentoring</b>	The ability to support others in growing and learning by providing guidance and advice
<b>Observing</b>	The ability to pay attention and notice insights from a set of actions
<b>Pivoting</b>	The ability to continually try out new ideas and move in new directions based on an understanding of present and future trends
<b>Persuading</b>	The ability to coax someone towards a certain desired outcome or decision
<b>Prioritizing</b>	The ability to create and manage a list of tasks, in order of their priority level

<b>Record-keeping</b>	The ability to create and maintain thorough documentation and records of all thoughts, communications, or iterations, among others
<b>Reframing</b>	The ability to consider a problem or situation from multiple unique perspectives
<b>Representing ideas visually</b>	The ability to transcribe and represent ideas in physical form that is not limited to drawing
<b>Story building</b>	The ability to build a compelling story and set of characters to represent the problem or idea at hand
<b>Story telling</b>	The ability to tell a story about the problem or idea at hand that engages and motivates the audience
<b>Synthesizing information</b>	The ability to take all the information that was gathered from observation and/or listening and formulating coherent ideas, conclusions, and inferences from that information
<b>Trust building</b>	The ability to create a supportive environment by communicating openly and honestly with team members
<b>Understanding tradeoffs</b>	The ability to know how consequences are tied together and how manipulating a circumstance will result in other outcomes
<b>Working under time pressure</b>	The ability to produce the desired results of ideation in short time frames that could range from weeks to hours

**Figure 7: Basic Skills of Designers practicing Human-Centered Design (Source: Kramer, Agogino, and Roschuni, 2016, p5-6)**

### Specialized Disciplinary Skills

We define a specialized disciplinary skill as one that requires formal education or extensive experience, generally representing a specialty or sub-discipline. Table 2 shows our list of specialized disciplinary skills for HCD.

**Table 2.** Specialized disciplinary skills for human-centered design

Specialized trade skill	Description
<b>Accounting</b>	The practice of preparing and examining accurate financial records
<b>Acting</b>	The technique of using words and gestures to tell a story and evoke a reaction from an audience
<b>CAD</b>	The use of computer technology to create representations of physical objects or designs
<b>Data analytics</b>	The ability to use mathematical and statistical techniques to explore, interpret, and analyze a set of quantitative data
<b>Engineering analysis</b>	The ability to analyze the technical engineering details of a problem, an idea, or a potential solution
<b>Filmmaking</b>	The ability to stage, shoot, edit, and produce a film in order to share a story
<b>Graphic design</b>	The ability to commit ideas and designs to paper or file via photography, Photoshop, Illustrator, and similar tools
<b>Laser-cutting</b>	The ability to design for and operate with a laser-cutting machine
<b>Manufacturing process design</b>	The ability to understand, conceive of, and create a process for manufacturing a product
<b>Photography</b>	The ability to capture photographs of meaningful situations or people, therefore sharing through visual communication
<b>Project management</b>	The ability to guide a team to initiate, plan, and execute a design challenge

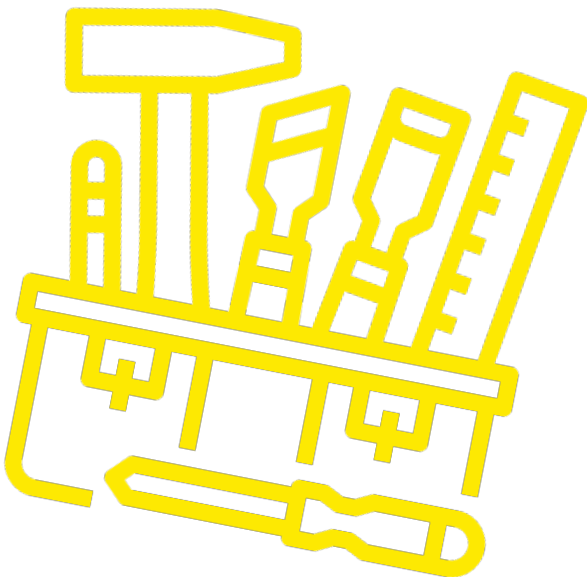
**Figure 8: Specialized Disciplinary Skills of Designers practicing Human-Centered Design (Source: Kramer, Agogino, and Roschuni, 2016, p5)**

# Human-Centered Cognitive Dissonance Tools

To this point in the thesis, I have established the foundation of CDT, its components, dynamics, and historical development. The previous section explains the experimentation of CDT in public health and the utilization or adaptation of CDT or its components in design initiatives. This understanding is necessary for one to develop their own strategies for utilizing CDT and identifying its dynamics in a design project.

In this section, I will introduce CDT-based tools and methods I have developed myself or adapted from other familiar design tools. By understanding the previous sections one is able to utilize the following tools and methods to take advantage of the insight CDT can bring to a designer in their quest to understand people.

These tools were created after the work detailed in my case study concluded. During that case study I will share how project work led to the development of these tools and give speculation on how these tools could have been used in the project.



## 12. Tools and methods for Tapping Into CDT for HCD

I have developed the following tools to aid designers in utilizing CDT to support the process of generating insights and drawing out potential solutions. These tools are the product of adapting common HCD tools and those shared throughout section 11. The practical inspiration of these tools come from my perspective of the experiences and reflection the scope team and I encountered during the Core Kenya project. The foundation supporting the methodology behind the tools in this section are the CDT dynamics outlined in sections 1-8.

The tools in this section are for designers who wish to take on CDT as a competency to use and improve on in their practice. During the case studies retrospective speculation I will use these tools to exemplify use and outcomes of utilization.

### 12.1. Classifying Value

As designers engage with communities, understanding what the community or target group values is critical. Doing so will allow designers to not only understand the magnitude of dissonance or consonance cognitions have, but designers can predict how people may accept or reject design solutions. Being able to predict acceptance or rejection allows designers to strategize for greater uptake.

During design research designers can begin to probe the level of importance of certain attitudes/beliefs, behaviors, and social norms. For example, if the design brief calls to reduce the use of processed foods, designers must first understand what value processed foods bring to individuals who eat them, what absences are left behind if that behavior no longer existed. I believe this understanding must begin early in the HCD process when designers are looking to understand the context their solution is meant to exist within.

HCD looks for how to generate value in solutions designers create, this is a key benefit to HCD. However, designers must also begin to understand what value attitudes, beliefs, behaviors, and social norms (cognitions) already have, that exasperate the challenge onto the community. While the challenge surely has negative effects on the target group (hence the effort to create a solution to overcome it), cognitions hold value, that is provide the target group with something meaningful despite its negative effects. Understanding the value of problematic cognitions helps designers better understand what it will mean to the target group if that cognition is contested by the designers new solution. Or, how hard the target group might fight to keep that cognition and reject the designers solution.

Earlier I established the magnitude of a consonance or dissonance state can not be measured numerically, therefore I will refer to magnitude as value under the classifications of low, moderate, or high.

**Low-value cognition** – These cognitions have very little importance to the target group. Other cognitions dissonant with cognitions of low value create a dissonance state with little to no magnitude. Often, a dissonance state may come and go without the awareness of the target group. Design solutions in contradiction to cognitions of low value are likely to face little to no resistance from the target group.

**Moderate value cognition** – These cognitions have some importance to the target group. Other cognitions dissonant with cognitions of moderate value create a dissonance state with a noticeable magnitude. Typically some kind of effortful regulation or reduction mechanisms are needed to reduce the dissonance state. Design solutions in contradiction to cognitions of moderate value tend to face some resistance from the target group and take moderate effort to gain adoption.

**High-value cognition** – These cognitions have high importance to the target group. Other cognitions dissonant with cognitions of high value create a dissonance state with exigent magnitude. Individuals are likely to have strong reactions to the existing dissonance state created by a new solution. High valued cognitions are difficult to change and face the most resistance by the target group when designer's solutions are in contradiction to high-value cognitions.

Solutions which disrupt attitudes, behaviors, or norms of high value most offer far greater attractiveness in their new cognition and or must diminish the value of the attitude, behavior or norms below alternatives. Making it psychologically uncomfortable to continue to hold the attitude, practice the behavior, or support the norm that is harmful.

As I look to understand the value an attitude, belief, behavior, or social norm has to a community member, I now look to answer 2 questions, in the discover phase of the HCD process;

1. What value does \_\_ (related attitude/belief/behavior / social norms) \_\_ have to the target group?
2. What would it mean to the target group if they were unable to \_\_ (observed behavior) \_\_?

Question 1 focuses on identifying what the target group perceives they gain from the attitudes, beliefs, behaviors, or social norms which relate to the challenge. It is important to gain an understanding of this value from multiple factors, emotional, physical, economic, etc.

Question 2 focuses on understanding the potential impact of a new solution that contradicts current cognitions. This is critical, because while solutions may solve one problem, the new solution may not fill the void the target group feels they have lost. This is key to acceptance and adoption of a new solution.

It is critical to keep in mind when I speak of value, it is from the perspective of the target group. Meaning must come from what the target group identifies as meaningful not the designers interpretation of what the target group, should, find meaningful. As stated previously in this thesis, valuable cognitions do not have to produce positive outcomes. Designers in HCD often understand the importance to separate personal preference from the preference of the target group but it must be reiterated here as it is easy to conflate the two when applying this thinking to a complex social challenge.

Designers must be aware of what their solution adds and subtracts from the current cognitive states. Done successfully designers can create strategic consonant and dissonant state touch points within their solution. I draw this conclusion by learning from the thinking explained in 10.1 Dissonance States in UX Design and 10.2 Design for Dilemma. This thinking can and should be applied to more social design challenges where the value of cognitions span not just physical, mental, psychological, social, and economic but deeply entrenched cultural and historical value as well. This is also inspired by Festinger's concept of magnitude. If designers can understand the value an attitude, belief, behavior or social norms has to a group they understand the magnitude of a potential CDS those cognitions, which allows designers to better predict uptake of an intervention.

## 12.2. CDT Paradigm Guide

Utilizing the Paradigms of CDT may guide designers to gain insights into the potential paradigm dynamics at play and how to take advantage of them when creating solutions. I have created the CDT Paradigm Guide (Figure 9) as a matrix of guiding questions designers are able to use during the discovery and ideation phases of the HCD process. With a basic understanding of CDT designers can use this matrix to understand what forces of CDT are prominent and relevant to the designers brief.

This guide defines the accepted paradigms of CDT and details the predicted response from people when a paradigm is at play. This does not mean people always act in the way described, however statistically a significant number of the target group should exhibit the predicted behavior based on years of experimentation. See section, Cognitive Dissonance States in Public health trials, to review results of trials conducted on paradigms of CDT.

These guiding questions have a multi-functional purpose. This guide is useful in aiding designers to craft areas of exploration when doing research. My learning of CDT began after the field research was conducted. After, we began exploring some themes inspired by CDT. Our team had questions that we could not answer, we did not adopt the Tension lens (see case study) used in Core Kenya until after field research was completed. By informing research by CDT our qualitative data would have also revealed more CDT dynamics for synthesis and analysis. The guide is also useful during synthesis. Exploring answers to these questions can lead to insights with a CDT lens.

The synthesis of Core Kenya occurred with partial support from themes of CDT. This guide includes questions that were inspired by the conversations the scope team and I had as we developed the tension lens. The guide also includes questions I asked upon my reflection of the project.



	Forced Compliance	Belief Disconfirmation	Effort Justification	Hypocrisy	The free choice paradigm
Paradigm definition	A person is pressured to say or do something that is against their personal attitudes, beliefs or behaviors.	A person is presented with a belief, attitude or behavior which contradicts their current belief/attitude or behavior.	A person creates reasons why a difficult or demanding task is worthwhile despite low benefit from the task. (e.g. a lot of work with little in return.)	A person is made to publicly advocate for a belief, attitude, or behavior. They are then reminded of their failure to do so in the past.	A person is presented with a choice between two or more options. Each choice has its own benefits and disadvantages. The advantages from the unchosen path creates a dissonance state.
Predicted response	A person will publicly comply with the behaviors. Used in short term their personal beliefs, attitudes, or behavior will likely remain. When the pressure no longer exists the target group is likely to return to their original cognitions. Can be effective if applied for a long term.	The more important the current belief, attitude or behavior is the more the person will defend it. They are likely to apply regulatory methods of contradiction, justification, or dismissal to defeat their cognition.	The target group is likely to justify a high effort for low benefit task. However, in the future they are likely to avoid doing that task again.	The person is likely to change their behavior in the immediate future. Without reinforced engagement the target group is likely to revert back to their previous behavior.	The person is likely to convince themselves the choice they made was the more beneficial one. If the dissonance state has high magnitude the person may swap their choice if possible.
Understanding the target group	<p>What is the target group pressured to think, say, or do? From whom do these pressures come from?</p> <p>What pressures oppose the target group's personal beliefs, attitudes, or behaviors?</p> <p>How does the target group react to the pressured attitude or behavior?</p> <p>What does the target group perceive is the reason for this pressure?</p>	<p>What external behaviors, attitudes, or beliefs oppose the target groups own personal cognitions?</p> <p>What does the target groups regulatory reasonings?</p> <p>How does the target group avoid encountering opposing external behaviors, attitudes, or beliefs?</p> <p>Why is the target groups current cognitions valuable/important, what meaning do they bring to the target groups life?</p>	<p>How does the target group perceive the effort it takes to do tasks related to the challenge?</p> <p>What does the target group perceive as high effort, what is perceived as beneficial?</p> <p>How does the target group avoid high effort low benefit tasks?</p>	<p>What does the target group publicly advocate for?</p> <p>Under what circumstances has the target group failed to follow what they advocate for?</p> <p>What does the target group consider "failing" to follow their public advocacy?</p> <p>How does the target group advocate for others?</p> <p>From the spectrum of personal to community wide, what level of publicity does the target group feel vulnerable?</p>	<p>What are the advantages and disadvantages of the choices the target group is considering? Do they have a true choice? (See Forced compliance)</p> <p>What or who is influencing the target group's choice externally?</p>
Analyze solution w/ CDT	<p>How might the solution influence a behavior or attitude?</p> <p>How might the solution maintain compliance?</p> <p>When is the target group aware of their forced compliance? if at all.</p> <p><i>Refer to Understanding the Target Group.</i></p>	<p>How does the solution oppose the target groups current attitudes, beliefs, behaviors, or community social norms?</p> <p><i>Refer to Understanding the Target Group.</i></p>	<p>How much effort does the target group perceive the solution demands of them?</p> <p><i>Refer to Understanding the Target Group.</i></p>	<p>How might the solution influence the target group to expose their positive behavior and harmful of attitudes, beliefs, or behaviors?</p> <p>How might the solution facilitate the target group to recognize and reflect on harmful attitudes, beliefs, or behaviors?</p> <p><i>Refer to Understanding the Target Group.</i></p>	<p>How does the solution resolve trigger or moderate a dilemma between choices, from the perspective of the target group?</p> <p><i>Refer to Understanding the Target Group.</i></p>

Figure 9: CDT Paradigm Guide

Overall the guide is best used to provoke thought and conversation among a team looking to use CDT as an aid in meeting an HCD challenge. This guide should be further refined and grow. With further iteration this guide can provide designers a structure to draw out CDT dynamic at play with in a given context and analyze the CDT dynamics their solutions might induce.

### 12.3. Deep Empathy Map

As a leader in Human-Centered Design IDEO explains, “Human-centered design is all about building a deep empathy with the people you’re designing for; generating tons of ideas; building a bunch of prototypes; sharing what you’ve made with the people you’re designing for, and eventually putting your innovative new solution out in the world” (IDEO, 2005. Designkit.org). The HCD ethos is built on empathy, putting yourself in people’s shoes in order to design for them. Empathy comes in three forms, Cognitive empathy, emotional empathy (also known as affective empathy), and compassionate empathy (or empathic concern).

“**Cognitive empathy** is the ability to understand how a person feels and what they might be thinking. Cognitive empathy makes us better communicators because it helps us relay information in a way that best reaches the other person.

**Emotional empathy** (also known as affective empathy) is the ability to share the feelings of another person. Some have described it as “your pain in my heart.” This type of empathy helps you build emotional connections with others.

**Compassionate empathy** (also known as an empathic concern) goes beyond simply understanding others and sharing their feelings: it actually moves us to take action, to help however we can.”

(Bariso, 2018, inc.com)

While HCD certainly activates all three types of empathy, it is cognitive empathy which is achieved through the use of methods and tools to reach that deep empathy IDEO speaks of. These methods and tools focus on cognitive empathy. They act as conduits to organizing and synthesizing the experiences of others. A common HCD tool for mapping the understanding of people is the empathy map (figure 10). It is the closest design tool that is widely recognized that I could find which begins to approach the themes of CDT. However, current empathy maps do not facilitate the organization nor understanding of the core dynamics CDT identifies as human motivators. Xplane, explains to its website visitors, “The Empathy Map gives you a deep-dive into the underlying motivations of your people to uncover why they are functioning the way they are” (Xplane, 2020). Xplane’s Empathy map, shown in figure 10, is made of 7 key parts, each part of the empathy map is supported by guiding questions. These parts and guiding questions read as follows;

**“1. WHO are we empathizing with? ·**

Who is the person we want to understand?  
What is the situation they are in?  
What is their role in the situation?

**2. What do we want them to DO?**

What do they need to do differently?  
What job(s) do they want or need to get done?  
What decision(s) do they need to make?  
How will we know they were successful?

**3. What do they SEE?**

What do they see in the marketplace?  
What do they see in their immediate environment?  
What do they see others saying?  
What do they see others doing?  
What are they watching and reading?

**4. What are they SAYING?**

What have we heard them say?  
What can we imagine them saying?

**5. What do they DO?**

What do they do today?  
What behavior have we observed?  
What can we imagine them doing?

**6. What do they HEAR?**

What are they hearing others say?  
What are they hearing from friends?  
What are they hearing from colleagues?  
What are they hearing second-hand?

**7. What do they THINK & FEEL?**

PAINS What are their fears, frustrations, and anxieties?  
GAINS What are their wants, needs, hopes and dreams?

(Source: x.xplane.com, 2019).” See figure 10.

**Empathy Map Worksheet**

Designed for: \_\_\_\_\_ Designed by: \_\_\_\_\_ Date: \_\_\_\_\_ Version: \_\_\_\_\_

**1. WHO are we empathizing with?**

- Who is the person we want to understand?
- What is the situation they are in?
- What is their role in the situation?

**2. What do we want them to DO?**

- What do they need to do differently?
- What job(s) do they want or need to get done?
- What decision(s) do they need to make?
- How will we know they were successful?

**3. What do they SEE?**

- What do they see in the marketplace?
- What do they see in their immediate environment?
- What do they see others saying?
- What do they see others doing?
- What are they watching and reading?

**4. What are they SAYING?**

- What have we heard them say?
- What can we imagine them saying?

**5. What do they DO?**

- What do they do today?
- What behavior have we observed?
- What can we imagine them doing?

**6. What do they HEAR?**

- What are they hearing others say?
- What are they hearing from friends?
- What are they hearing from colleagues?
- What are they hearing second-hand?

**7. What do they THINK & FEEL?**

**PAINS**  
What are their fears, frustrations, and anxieties?

**GAINS**  
What are their wants, needs, hopes and dreams?

1. WHO are we empathizing with?
GOAL
2. What do we want them to DO?

7. What do they THINK & FEEL?

PAINS
GAINS

What other thoughts & feelings might motivate their behavior?

6. What do they HEAR?
3. What do they SEE?
4. What do they SAY?

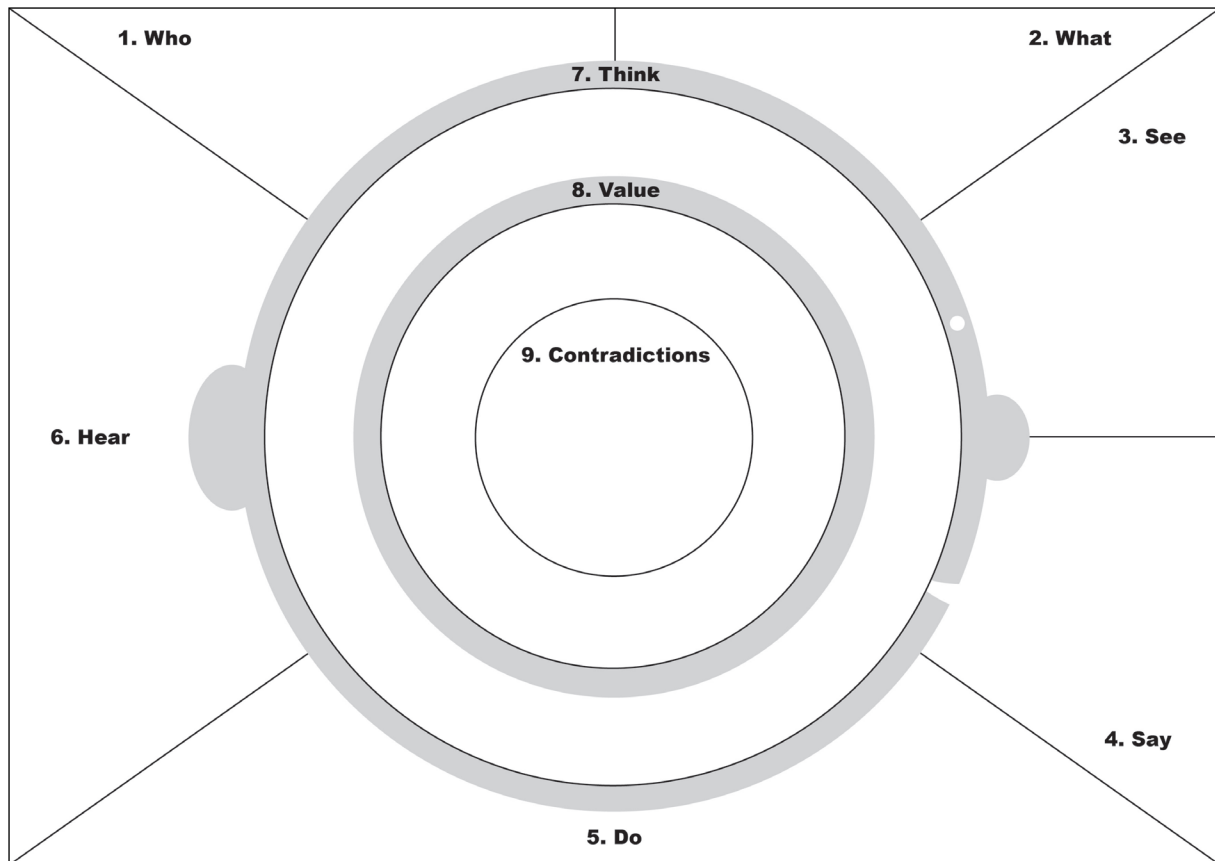
5. What do they DO?

**Figure 10: Empathy Map (Source: x.xplane.com, 2019)**

Designers are no stranger to Empathy Maps or the content they capture. Empathy maps organize beliefs/attitudes, behaviors, and social norms detailed in Festinger’s Theory of Cognitive Dissonance. 5 of the 7 Empathy Map parts are touch points for the cognitions outlined in CDT. Refer to figure 10, Xplane’s Empathy Map; Beliefs and attitudes are represented by section 7, think and feel, behavior is represented by section 5, do, and social norms are represented by section 3 see, 4 say and 6 hear.

Where the Empathy Map does not venture is facilitating strong linkages between the cognitions it maps. I propose augmenting the traditional Empathy Map to include the dynamics of value and contradiction (figure 10). These additional elements will allow designers to utilize CDT to dig deeper into the cognitive dynamics at play among people. While the original Empathy Map allows designers to understand their user’s perceptions of their reality. I have developed what I refer to as The Deep Empathy Map, allowing designers to understand what forces build and reinforce those realities.

The elements of the Deep Empathy Map come from Festinger’s explanation of magnitude (refer to section 6) and the dynamics of a CDS’s (refer to section 5.2).



**Figure 11: Deep Empathy Map**

The Deep Empathy Map is comprised of 9 key sections. While certainly more complicated than the original Empathy Map the additional sections walk designers through a process of mapping cognitions, defining the value of cognitions, and identifying contradictions between an individual's reality. Utilizing and building off Xplane's original Empathy Map, The Deep Empathy Map (figure 11) reads as follows:

**WHO**

- Who are we empathizing with?
- Who is the person we want to understand?
- What role do they play in the challenge?
- What choices do they struggle with?
- What do they want?

**WHAT**

- is the challenge?
- What is the aspired outcome?
- What are the current undesired outcomes?

**SEE**

- What do they see others doing?
- What are they watching and reading?
- Where do they see, watch, or read these events or materials?

**SAY**

What do they say?  
Who do they talk to?  
Where do they have these conversations?

**DO**

What do they do?  
Who do they do it with?  
Where do they do it?  
Who supports what they do?

**HEAR**

What do they hear?  
Who says it?  
Where do they hear it?

**THINK**

What do they think about their situation?  
What do they think about the challenge?  
What do they think about what they see, say, do, or hear?  
What makes them confused, angry, frustrated, anxious, or disgusted?  
What makes them feel stable, happy, calm, trusting, intrigued?

**VALUE**

What is important to them? Why?  
What is not important to them? Why?  
What do they fear? Why?  
What do they aspire to? Why?  
What do they think is important to see, say, do, or hear? Why?

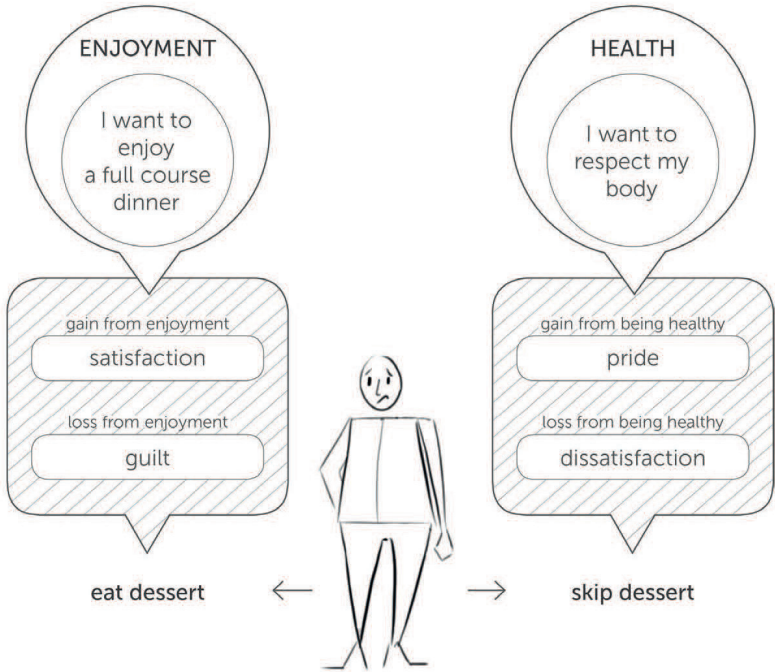
**CONTRADICTION**

What contradictions exist in what they see, say, do, think, hear, and value?  
What do they think about these contradictions?

The key feature of the Deep Empathy Map is the ability for designers to make the connection between a target group's perceived reality, held values and cognitive contradictions. As this thesis has outlined when designers understand what people value they can better predict how difficult the belief, attitude, behavior or social norm is to change. Understanding not only their reality but what value that reality has to the individual allows a designer to achieve deeper cognitive empathy. Identifying contradictions gives designers clues into what methods of regulation and reduction their target group currently employs and predicts how they may reject or embrace the designer's solution.

## 12.4. Dilemma Map

Deger Ozkaramanli’s model of dilemmas (Figure 12) details mental conflicts customers face when engaging with products and services. This is addressing the free-choice paradigm (refer to section 8.4) described earlier in this thesis. Ozkaramanli’s designing for a dilemmas approach has high overlap with CDT, and therefore fitting to find synergy points. Ozkaramanli’s three key components, Mutually exclusive choices, conflicting concerns, and mixed emotions strongly relate to CDT’s components of cognition, inconsistency, and dissonance states. Together, components of the model of dilemmas and CDT components can create a tool that facilitates designers to think on the higher level of human psyche Ozkaramanli speaks of.



**Figure 12: “Model of dilemmas for designers illustrating the three main ingredients of dilemmas (mutually exclusive choices, conflicting concerns and mixed emotions” (Source: Ozkaramanli, 2017. p30).**

Building off Ozkaramanli’s Model of dilemmas, I have created the Dilemma Map (figure 13) which facilitates the mapping of conflicts between two choices. CDT says where there is cognitive conflict, a dissonance states is likely to exist. While the Deep Empathy Map is meant to facilitate understanding of a range of conflicts within a target group, the Dilemma Map facilitates understanding of a specific dilemma between two choices (or dissonance state). To do this the map is bisected representing two conflicting circumstances or choices, each with 6 sections. Written from the perspective of the target group the sections are as follows;

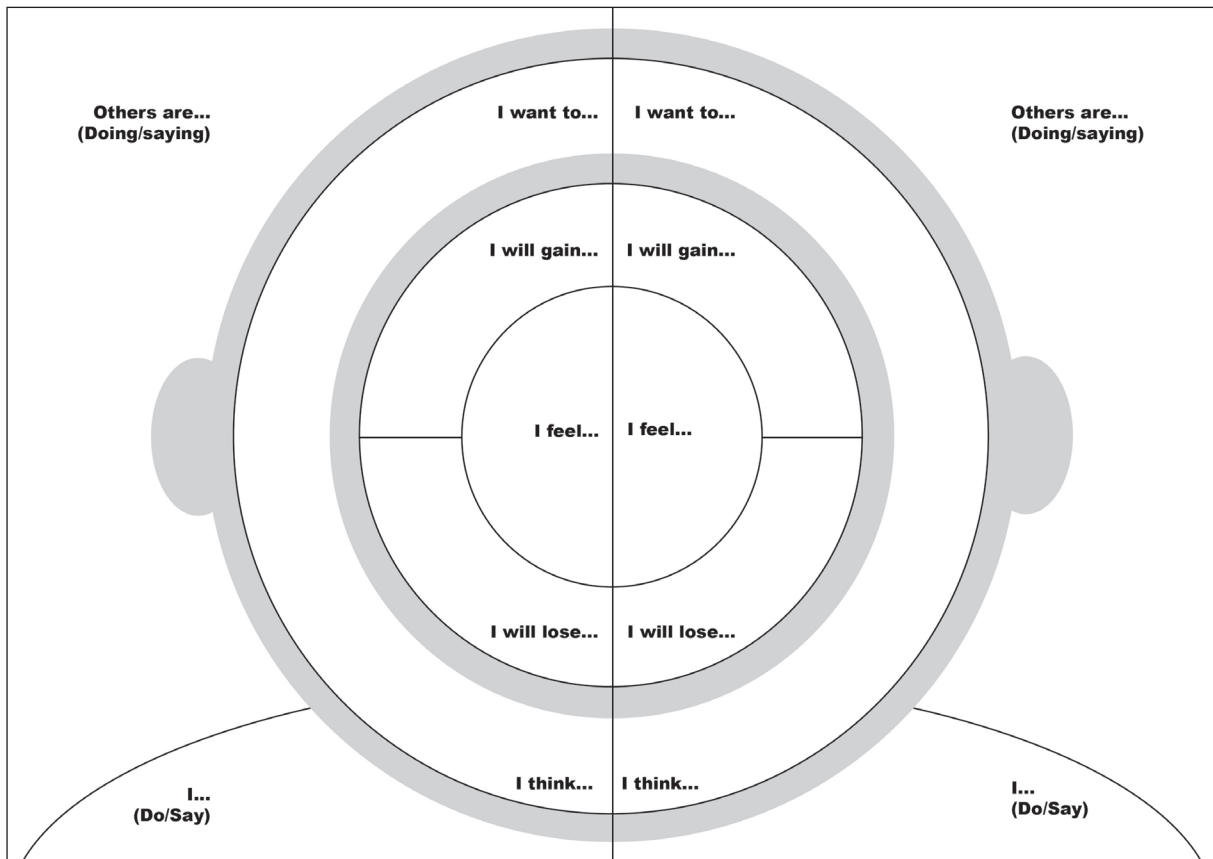


Figure 13: Dilemma Map

**I...(do/say)**

What are the mutually exclusive choices that the target group is making? In other words, what is the opposing situation? From the designer's perspective, this could be understood as the choice between a healthy and an unhealthy behavior or attitude.

**Others are... (Doing/saying)**

What are others in the community saying or doing that is influencing the choice the target group is making.

**I want to... / I think**

What does the target group want when making this choice? What thoughts does the target group think about, that support this choice?

**I will gain...**

What does the target group perceive they will gain or benefit by making this choice?

**I will lose...**

What does the target group perceive they have to lose by making this choice? What worries or concerns does the target group have about making this choice?

**I feel...**

What emotions does the target group experience by making the choice?



The Dilemma map has two key beneficial touch points in the design process. The first is during the understand phase of the design process. The second is analyses of potential solution nearing the end of the create phase.

During the understand phase designers can map the dynamics and motivations behind key choices that make up the design challenge. On one side is the target groups behavior the challenge is set around. In the context of this thesis it is a behavior which is ultimately harmful to the target group. On the other side the designer places the behavior change the design brief calls for, e.g. what is the brief trying to get people to do instead. I will exemplify this in the coming case study retrospective speculation. If the brief has no specific desired behavior, use the challenge in the negative. E.g. if one side is “performing the harmful behavior” the other is the choice **not** to “performing the negative behavior.”

In the create phase the Dilemma Map can be used to analyze the mental landscape the target group may be faced with when choosing between the current behavior and the proposed solution. This is a useful exercise in comparing what the target groups current behavior offers vs what the designers solution is offering. For the most impactful analyses I would recommend using this map in collaboration with the target group in some way after testing prototypes.

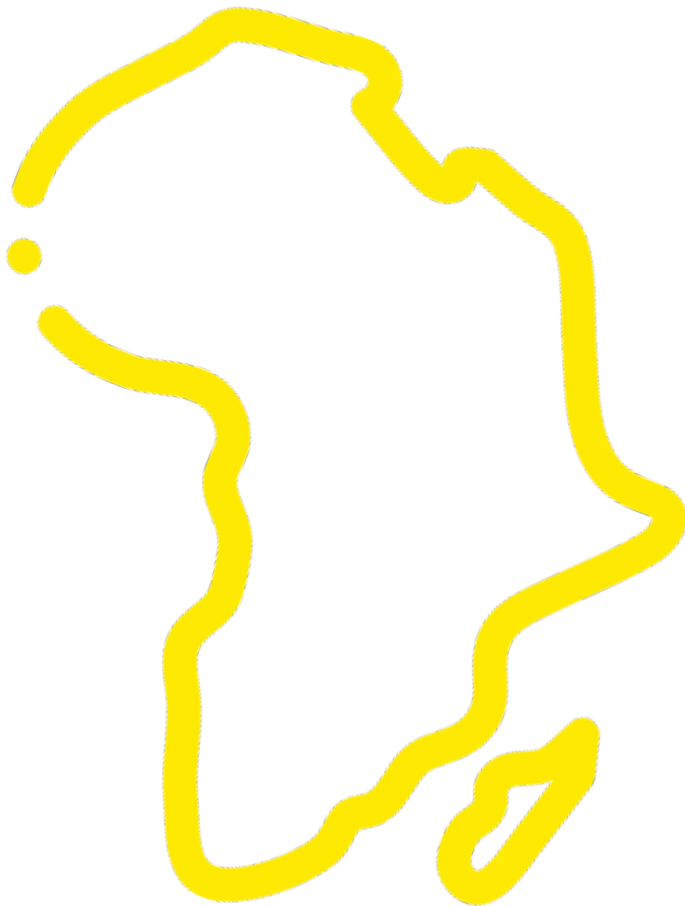
By looking at a target group’s choices in this way designers can achieve an understanding of the psychological motivation of a target group. To simplify, this map displays the pros and cons of choices a target group makes and allows designers to manipulate those benefits and drawbacks for positive outcomes.



# Core Kenya, Discovering Tension

The previous section provided tools and methods to classify the magnitude of a CDS, identify and leverage potential paradigms at play, map cognitions, value, contradiction, and dilemmas. These tools and methods have the potential to allow designers to capitalize on the knowledge CDT can offer in understanding people and use that knowledge for positive impact.

In this case study, I will exemplify how the tools, methods, and ways of thinking I have detailed in this thesis manifest themselves in the design project known as Core Kenya. I will first describe the project and what role CDT played in its development. I will then draw hypothetical scenarios to further exemplify what I have discussed in this thesis.



### 13. Core Kenya Early CDT Exploration

Core Kenya is one stream in a larger project conducted by Scope Impact (formally known as M4ID) from 2018 - 2019. Funded by the Bill and Melinda Gates Foundation, Core Kenya is an exploration into the attitudes, beliefs, behaviors, and social norms of family planning in Kenya.

“Family planning encompasses the services, policies, information, attitudes, practices, and commodities, including contraceptives, that give women, men, couples, and adolescents the ability to avoid unintended pregnancy and choose whether and/or when to have a child” (Starbird, Norton, Marcus, 2016. p191). Effective employment of family planning can reduce infant mortality, aid in HIV prevention, empower people, enable education, reduce adolescent pregnancy, and reduce overpopulation, as outlined by the World Health Organization. For an individual, access or the lack thereof to family planning methods has physical, mental, psychological, social, and economic implications.

The Scope team wished to “gain insights into the unmet needs of women across their life course, into how family planning decisions are made, especially the role of men in decision-making as well as their influence on the sexual and reproductive health of their partners in general” (Scope Impact, 2019. Thisiscore.com). The backbone of Core Kenya’s research is built on approaching health and wellbeing from across a life course. This allowed the team to pinpoint transformative events in adults, adolescents, and couples’ lives. By exploring family planning along the life course, the team received a wide range of qualitative data that built a broad perspective of the relationship family planning has at various stages of a person’s life.

To do this, a design game called the Coupling Game “was developed in-house at Scope for Core’s second Discover phase. In October 2019, the team traveled to Kilifi, a coastal town close to Mombasa, in south-eastern Kenya. They completed a total of 24 sessions, with both women and men of different ages between 18–49, religious influencer’s, and healthcare providers such as community health workers and family planning counselors” (Scope Impact, 2019. Thisiscore.com). The team would also travel to the towns of Kiambo and Kajiado Kenya. The game plays through key relationship milestones over the course of one’s life. Participants of the game, both men and women, shared qualitative data about their experiences during these milestones. The result of this qualitative data gave the Scope team insights into “the individual, interpersonal needs and dynamic relationship between both genders (situated within social norms and pressures) playing a role in SRHR (Sexual and reproductive health and rights) decisions” (Scope Impact, 2020. Thisiscore.com). You can learn more about Core Kenya’s research through the [Scopeimpact.fi](https://scopeimpact.fi) site.

## 13.1. Applying CDT to Core Kenya

I joined the Scope team as a service designer after field research was completed. I, alongside the Scope Core Kenya team began synthesis and analysis of the Core Kenya data. This began like the typical Define stage of the HCD process, where designers look to frame a challenge based on the insights gained from research.

Our earliest discussions were focused on; recognizing a lack of sexual and reproductive health (SRH) education in schools, beliefs that brand talking topics related to sex as ungodly and frowned upon, lack of SRH autonomy among women, and low SRH resources as obvious barriers to family planning. The team was also able to identify how attitudes and behavior on family planning changed through the passage of milestones from adolescence to adulthood developed along the life course. These involved milestones like circumcision, turning 18, graduating from school, sexual debut, coupling, and employment to name a few.

While important, our client longed for something deeper in our team's perspective of the findings. Among those who work within the area of family planning the aforementioned barriers and milestones are common knowledge. To address these barriers solutions like advocating for SRH education, SRH campaigns, and free SRH products and services have made noticeable impact on family planning. However, the most vulnerable population have significant strides to make in SRH and healthy family planning utilization. To clarify, family planning can happen in various ways and does not necessarily have to be western solutions like pills or injections, although these were popular among adult women. Our team was tasked to seek deeper understandings of known perspectives or (more ambitiously) find new perspectives, the public health and development sector could approach family planning.

To find these novel perspectives we began to brainstorm for new approaches to how our team thought about the challenge. The early stages of my CDT exploration ran parallel to Core Kenya, I would share my learnings from the literature as I read. My knowledge of CDT was incomplete, in progress, and not the more robust understanding I have as I write this thesis. Yet, the CDT knowledge I gained in these early days of my learning I shared with my team, this knowledge played a role in triggering the development structure of Core Kenya's design drivers.

Our team discussed CDT related ideas and the importance of understanding mental motivators within our brainstorming sessions. CDT related discussions mainly focused on understanding the value of attitudes, beliefs, behaviors, and social norms to an individual around various family planning outcomes. We discussed the barriers and milestones mentioned earlier from the perspective of what value they have to an individual and community on a psychological level.

For example, we looked at behaviors and attitudes toward condom use of young men engaged in risky sexual behavior. These young men typically had an adverse attitude toward condoms. A widely understood perspective of these young men is the attitude that condoms reduce pleasure and therefore,

some young men may refuse to use a condom even if sex may result in an unintended pregnancy or an STI. Young men valuing pleasure is not a novel perspective for those who work in the world of family planning. As our team looked for more dimensions, we probed deeper into understanding what young men valued and how it linked to condom use. We questioned, what does the young man engaged in risky behavior have to gain by not using a condom? The research showed links between risky sexual behavior and the desire to prove one's manhood. The communities our team spoke to reported significant data which indicated masculinity and femininity were prominent indicators of social acceptance, and as all readers of this thesis are aware (by CDT and personal experience) social acceptance or rejection is a powerful influencer. In short, by viewing young men and condom use through the lens of what is valuable to him, our team was able to hypothesize a deeper multidimensional perspective on why some young men reject condoms with no desire to have a child or take other measures to avoid an STI. While some at risk young men value immediate pleasure over the longer lasting benefits of a condom, he may also believe not using a condom makes him more of a man, shows masculinity, and has a strong desire to be recognized as a man. Deeper dimensions allows designers a more fertile creative ground, one which germinates potential solutions.

Masculinity and femininity were important, it became clear the gendered dynamics of the community were undeniably omnipotent in the matter of family planning. Each behavior or attitude taken has the power to validate or invalidate an individual to themselves, their partner, family, and immediate social community. The community spoke of behaviors and attitudes toward family planning and identified how said behaviors would or would not make some a "real" man or woman.

Our team would go on to explore and question what the interjection of healthy use of family planning would mean from a CDT perspective. We asked ourselves questions like; if the young man who deeply values masculinity, believes he affirms his masculinity through unprotected sex, what does having sex with a condom mean to him? Our team did not have an answer to this question from our qualitative data, therefore we could not answer this question directly. However, data was reported on reasons why some young men did not want to use condoms. The reasons being, they reduce pleasure (as established), they cause a rash, they cause cancer, they smell, they have dangerous chemicals, and they are for older people. These are potential regulation methods. Some of these reasons are not unreasonable, some people have a latex allergy, some condom brands have distinct odors. Still, many young men lack comprehensive sex education allowing misinformation to grow. We continued thinking, sex education is limited, lack of sex education also means that many young men are not likely to know how to put on a condom, leaving them clumsy to apply in their early years. This combined with condoms not being easy to come by in some places (adults might not sell them to a younger person of high school age, assuming he can afford to buy one) and the community stigma around sex might keep young men mentally at bay. From the perspective of CDT, what our team could infer about what it means for a young man to use a condom? It means he must face social stigma from the adults in his community to acquire a condom, potentially feel embarrassed in front a girl he likes leaving him feeling emasculated, all to have protected sex and know

he is an outlier in his peer group. These are all moments where CDS's are likely to exist. So, he avoids the foreseeable mental discomfort, and rejects condom use. When one thinks of this mental discomfort combined with the practical barriers to access, it's not difficult to imagine why one may take the attitude of it is easier to have unprotected sex, it's less stressful in the short term. Under CDT, we could infer, having unprotected sex, with the future potential to get an STI or cause an unintended pregnancy is more mentally habitable than the immediate scrutiny, embarrassment, and ostracization of what it takes to use a condom. It is well known delayed gratification in young adults has not reached maturity but increases over time (Romer, Duckworth, Sznitman, & Park. 2010). The mental storm that exists around using a condom is significant in young adults and not as simple as just "wrap it up." Thinking in this way led our team to not only identify barriers to condom use, but understand the pressures and scope of mental stress condom use and non use can exert (these discussions occurred for a number of challenges not just condom use).

Through these discussions, our team began to think less of the obvious and more tangible barriers (which were well researched and saturated with interventions) and more on psychological drivers and barriers influencing family planning. We aggregated qualitative data through a combination of affinity and empathy mapping through the lens of how psychologically valuable or important specific attitudes, beliefs, behaviors, or social norms were to people. We used elements of the Empathy Map (See figure 10) and organized the data by what people saw, did, heard, and what they thought across the life course, then began to try and make sense of connections through the clustering of data by themes within each grouping of the Empathy Map. Eventually, the question became what are people valuing in each grouping? What do they have to gain or risk losing not only physically or practically but mentally and emotionally? What are they doing to keep the attitudes, beliefs, behaviors, or social norms which hold high psychological importance?

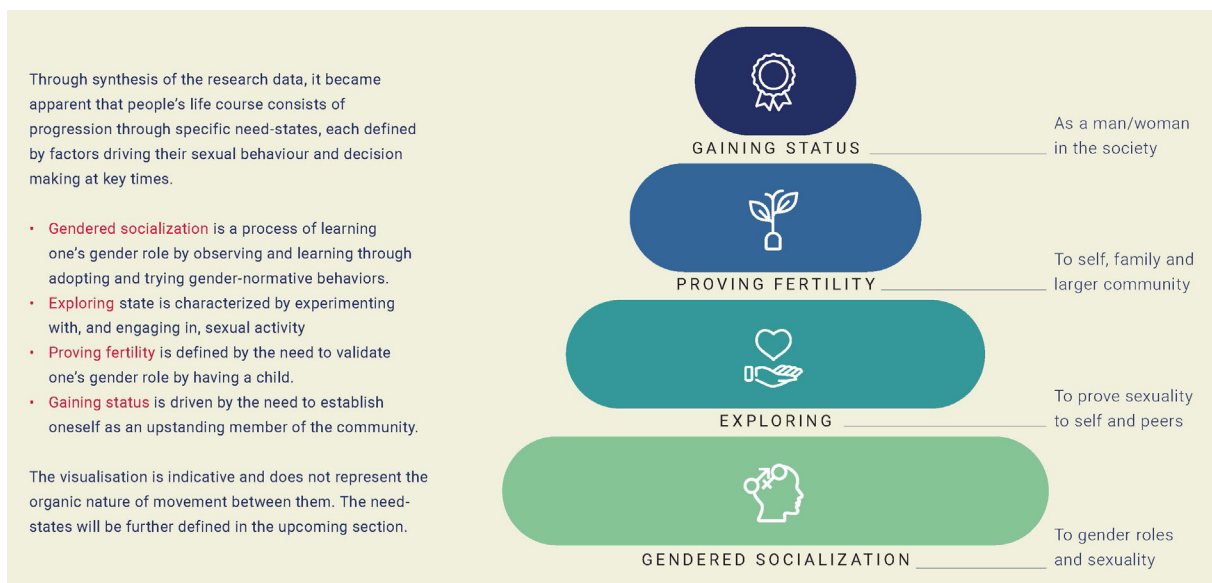
This approach led the team to find 4 key stages along the life course where individuals seem to become highly motivated in their use or non use of family planning. While these discussions started from CDT and understanding what people valued psychologically. Our team redefined this lens to more appropriately communicate within the world of public health and development. We referenced the Need-Scope Model to reframe "value" as needs. Our team took on the approach that the attitudes, beliefs, behaviors and social norms we were finding in family planning were perceived as needs from the target group. This is how the concept of Need-States were born. "Need-states are characterized by tensions between people's personal desires and social pressure. This often results in making decisions favoring short term rewards associated with a need-state instead of long term goals, which leads to conflicts (internal or social)" (Gendered Lens on Family Planning Core Kenya, 2020. p46).

"The team formulated the 'need-states' lens, positing that to understand family planning behavior, it is important to understand the nature of sexual and reproductive activity and how it is influenced by key needs or 'need states'. Similar need states guide the behaviors of both men and women. The need states identified were [see figure 14]:

- Proving status as a woman/man to the society
- Proving sexuality to self and peers
- Proving fertility to family and the larger community
- Learning about gender roles

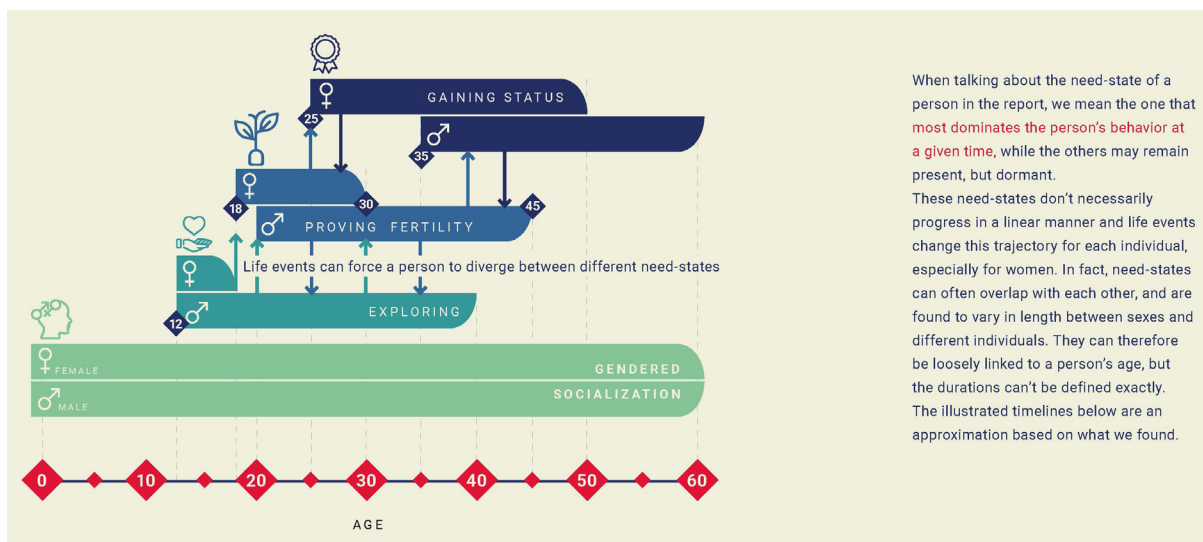
- Sexual and reproductive activity is driven by these key need-states

Progression between these need states is not necessarily linear and need states can come back into dominance based on life events. Conflicts (internal or social) arise when a person doesn't feel that they are able to move on to the next 'level' or satiate a need-state" (ScopeImpact, 2019. Thisiscore.com). See figure 14.



**Figure 14: Core Kenya Need States (Gendered Lens on Family Planning Core Kenya, 2020. p7)**

Using the qualitative data gained from the field, the team and plotted these need states along the life course. We analyzed how need states evolved over time and differed between genders. See figure 15.



**Figure 15: Core Kenya Need States along the Life Course (Gendered Lens on Family Planning Core Kenya, 2020. p8)**

Core Kenya’s need-states begin with the socialization of sex and gender on children, this socialization never truly ends but is most prominent in the early years of a person’s life. During this stage, children are oriented by their parents, peers, and their environment to the gender roles of the community. Girls are made to tend to domestic duties while parents tend to give boys are allowed to skip chores and play, girls are raised to be sexually modest women while boys are given the freedom and almost expected to explore sex.

Adolescents and young adults tend to exist in the Exploring need-state. Where individuals are curious or actively making attempts to learn about sex, their sexuality and find their vision of a partner. On the contrary, sex and expression of sexuality are a strong taboo within this context, leaving individuals in this stage with few options for fulfilling that curiosity. During this phase is where young adults seem to have the most sexually risky behavior that could lead to adolescent pregnancy or an STI. Typically girls and young women displayed this phase very differently than boys and young men. While girls tend to explore with the aspiration of coupling, boys tended to explore more for the experience of sex (It is important to note same-sex and gender variant couples were not explored in this research). The earlier example explaining young men opposition to condom use would later be assigned under the Exploring need-state.

Adults, both men, and women tended to look to prove their fertility. This need-state was nearly required if one wanted to one day ever gain the full respect of the community. This is marked by the drive to have children or show that one has the ability to have children.

The final need-state is gaining status, this is the drive to earn the community’s respect and admiration. This state is marked by individuals wanting to be leaders, their public behavior is oriented to show others that they are someone to look up to. Adults tended to enter this need state later in life after alternating between prior need states.



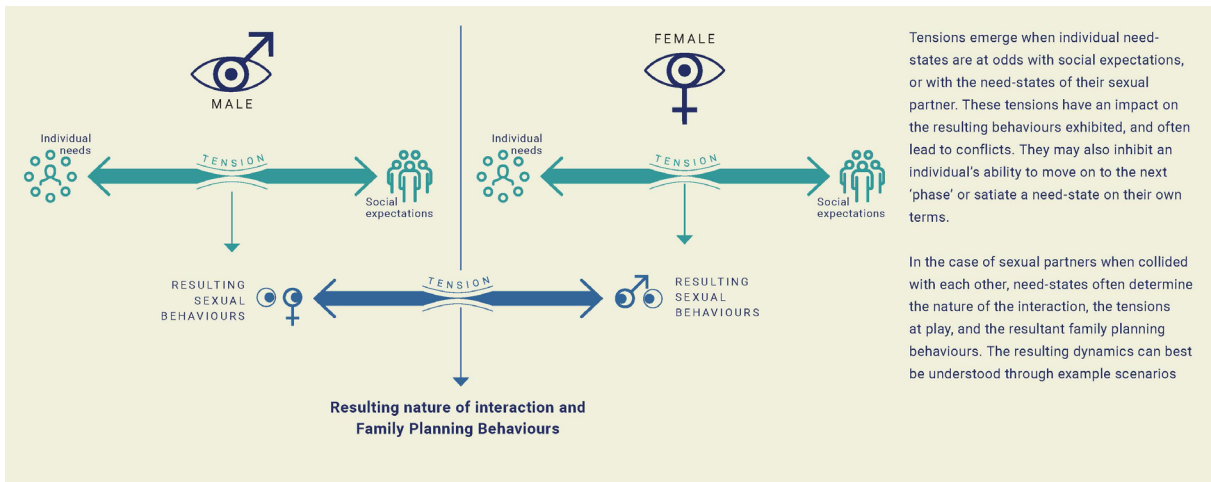


Figure 16: Core Kenya Need States along the Life Course (Gendered Lens on Family Planning Core Kenya, 2020. p9)

Need-states are epicenters for tension moments that result in negative health outcomes related to family planning. “Tensions emerge when individual need-states are at odds with social expectations, or with the need-states of their sexual partner. These tensions have an impact on the resulting behaviors exhibited, and often lead to conflicts” (Gendered Lens on Family Planning Core Kenya, 2020. p9). These tensions are what I have referred to as dissonance states in this thesis. Tension moments often precede harmful family planning behavior, attitudes and social norms. These moments are not the sole cause of negative family planning outcomes however they can be potential indicators or instigators with significant influence on attitudes and behavior. Our team identified 3 critical need-state intersections (figure 17), between men and women in committed or non committed couples. We labeled these intersections as the transactional, exploring X2, and committed yet conflicted intersections. I will explain the tension (CSD) dynamics of these intersections our team identified.

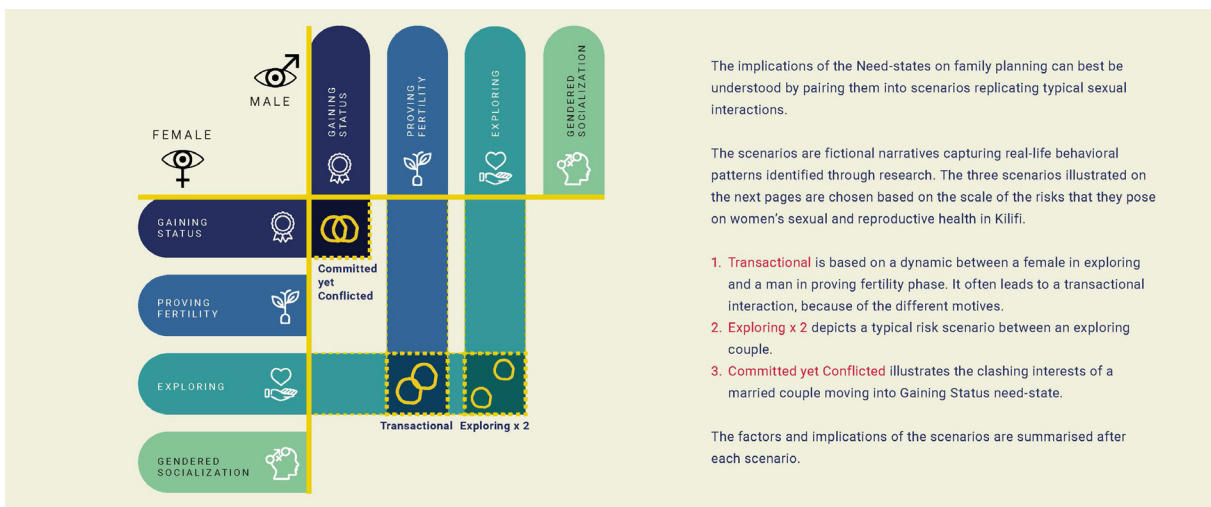


Figure 17: Core Kenya Need State Intersections, (2020)

The transactional intersection is defined by a woman in the Exploring Need State and a man in the Proving Fertility need-state. Typically women in this Need State are around adolescent age, inexperienced in sex and relationships, and attract the attention of men as they are becoming young women. These young women's orientation towards partnerships yet not presently desiring to have children, is often in conflict with a man's desire to prove he is able to have children causing a CDS. Men who are looking to prove their fertility are typically post adolescent years (30's), not looking for committed partnerships, nor to start a family or rear children. This dynamic of a younger woman looking to explore her sexuality through a partnership and an older man seeking to confirm his ability to have children, often result in a transactional relationship. The man offers the young girl gifts, transportation, a cell phone, etc. catering typically to her economic needs. When this happens young women reported feeling both obligated and more willing to engage in sex with the man. The man may even use his gifts as a reason to directly reason with her as to why he is owed sex. If a man in proving fertility learns a young woman has become pregnant, he is likely to claim she has become pregnant on purpose as a way to trap him in a relationship, claim it's her responsibility to prevent pregnancy, and or abandon her as his state drives him to build his confidence in his ability to have children, not be a father and take care of said children. This is not the only outcome of this intersection, yet was the most significant to health and wellbeing from the data collected, this is true for the examples of Exploring X2 and Committed yet conflicted intersections.

Exploring X2 is defined by both young men and women, typically of adolescent age, exploring their sexuality with one another. Both are inexperienced and learning about sex and expression of sexuality. As stated previously, young men and young women navigate this need-state very differently, while young women are looking to explore their sexuality within a committed relationship the young man's priority is exploring his sexuality without commitment. This creates a tension. These expectations are sometimes not communicated or one individual in the couple may outwardly align their attitude to match the others while internally having an opposing private attitude. This often was reported by young men telling girls they wanted committed relationships while having multiple partners. Combined with this dynamic is some young mens rejection toward the use of condoms, limited access for young girls to access birth control pills or injections (their parents are unlikely to approve), and young people in this state feeling like the risks of such activity will not happen to them, all support the proliferation of STI's and unintended pregnancy. CDT would suggest young men at this intersection experience a CDS as their expressed and private attitudes are in conflict. Young women at this intersection are likely to enter a CDS once finding out their partner does not want the same committed relationship the young woman herself is looking for. Both are in CDS, as engaging in a sexual relationship is highly frowned upon in the community, both face social scrutiny about their sexual activity. Young women are pressured to practice abstinence and are discouraged to explore sexuality. Young men on the other hand, are generally discouraged by the community to explore sexual behavior, and are also encouraged by older men close to them to do so in contrast. Consequences for young men who are found engaged in sexual activity are few, while a young woman is likely to face harsh punishment from the adults around her. However young men and women's peers tend to

encourage their sexual exploration. The dynamic of this intersection creates many CDS's, resulting in young people to keep their activity hidden and unlikely to seek help from adults about sexual activity, while confiding in their peer group which is often inexperienced or misinformed.

Committed Yet, Conflicted is the intersection of need-states defined by conflicting path ways for men and women to gain status. Gaining status is a need-states which one enters typically later in life. At this intersection a man's desire to have many children in order to establish his status and respect of the community begins to conflict with his partner's desire to slow or stop having children due to the physical strain of un-spaced pregnancies. A part of his status as a man is making the household decisions and therefore he decides when to expand the family. Yet, through his perspective he sees family planning goods and services as a woman's responsibility. If she decides to seek family planning without her partner's input and consent he feels disrespected as a man, if she is to ask him about family planning it is not a man's area to involve himself. This contradiction results in a CDS where she must make the decision to suffer the economic and health risks of un-spaced pregnancy or to access family planning in secret. In choosing the ladder, eventually her partner finds out and she is repercussed by her partner sometimes resulting in violence. Her partner also enters another CDS at this intersection. His goal is to gain the respect of his adult peers by showing he can not only have, but take care of many children, making him a leader. For the most vulnerable men in the need-states of Gaining Status his pursuit of having many children, pushes him and his family into poverty. Men are expected to lead their family into financial prosperity. A CDS is likely to occur as fathers who are unable to provide for their children are looked down upon yet are praised for having more children, perpetuating a debilitating loop where he pushes to have more children to gain respect putting his family in greater economic stress and seeks more children to gain the respect diminished by his family's financial situation.

Our team identified a number of potential CDS's at each intersection, we labeled these as tensions. The lens of tension or CDS gave the team and I another dimension to see the qualitative data. By analyzing these tension points we created design drivers which the team could generate solutions to relieve the tensions that induce harmful family planning attitudes, beliefs, behaviors, and social norms. Some of these drivers focused on women, some on men, while others address both genders. Figure 18 shares some of the tensions our team found and the design drivers inspired by the tension moment identified.

### Transactional

Tension	Design Drivers
<p>Young men are insecure about their identity and resort to gender normative behavior such as wooing girls to boost their status and self-confidence. Adolescent girls easily become targets of such behavior, as they have little risk awareness and are inclined to keep their sexual exploration a secret. In addition, girls are raised to depend on men for financial and emotional security, and find it difficult to turn down offers even if they want to. Men can misuse this dependency in order to fulfill their own goal of proving fertility.</p>	<p>Reframe manhood beyond existing gender norms: give young men models for positive masculinity and gender equality. Promote taking responsibility of others as part of masculinity</p> <hr/> <p>Help girls to become more aware of risks related to transactional scenarios and build their resilience to men's approaches by offering them alternative pathways to reach their future goals.</p> <hr/>
<p>Men in proving fertility phase feel social pressure not to use contraception, because they get social credit from a pregnancy. Young women, who are not necessarily aware of their own sexual rights and are socially expected to follow the man's lead, aren't capable of negotiating contraception use. Nevertheless, girls have to bear the negative consequences of unintended pregnancies, whereas men's future goals are not put into risk by them.</p>	<p>Promote family planning as a means to reach future aspirations and unprotected sex as a potential barrier to gaining the desired social status.</p> <hr/> <p>Build mechanisms for detecting and condemning sexual misconduct by men. Bring about awareness of men's responsibility in the cases of unintended pregnancies.</p>

### Exploring X2

Tension	Design Drivers
<p>Girls are not taught about sexuality for fear of encouraging them to explore sex, which leaves them to explore on their own without proper guidance. Boys, on the other hand, are expected to start showing masculine assertiveness, but are not given a proper model for positive manhood. The information void is easily filled with misinformation and negative influences detrimental to SRH outcomes. This leads to risky impromptu encounters between boys and girls.</p>	<p>Help adolescents to build empathy towards each other by offering them comprehensive, factual information on sexuality and SRH.</p> <hr/> <p>Offer boys and girls alternative pathways for becoming respectable members of the society. Teach them mitigation strategies for overcoming potential challenges.</p> <hr/>
<p>Adolescents don't necessarily see risks related to unprotected sex threatening to their future. Limited access to FP services diminishes the likelihood of contraceptive use. Girls are further discouraged by their lesser decision making authority.</p>	<p>Make adolescents more aware of risks of unintended pregnancies to their future goals.</p> <hr/> <p>Make SRH services more accessible to adolescents by removing the stigma of using them and by training the staff how (and why) to better address young people's needs.</p>

Figure 18: Continues on next page

### Committed Yet, Conflicted

Tension	Design Drivers
<p>A family's status is linked to the number of family members, which creates social pressure for women to give birth and makes birth spacing hard for couples. Before achieving a sufficient social status, men are not always open to negotiate a stop on having children. As a consequence, women are afraid to bring up the topic and rather resort to secretive use of FP.</p>	<p>Provide people with examples of different pathways to achieving social status. Leverage the shift to smaller family units that is already happening among more modern urban people, especially celebrities.</p>
<p>Women with children get access to FP information and services, while men are often deterred from being associated with FP by fear of being seen as weak or feminine by their peers and family, as women's agency in decision making is seen as a threat by men. Men's lack of awareness of FP leads to misconceptions about contraceptives and reduces their usage.</p>	<p>Rebrand the image of family planning to be less about mothers and more about supporting a family to discuss how to best reach the common goals. Target men as central to this discussion. Debunk the long lived myths about contraception as harmful to one's fertility or masculinity.</p>

**Figure 18: Core Kenya Tensions and Design Drivers (Gendered Lens on Family Planning Core Kenya, 2020. p18-19, 28-30, 38-39)**

Core Kenya at the time this thesis is written has concluded its Discover phase of the HCD process. Developing these design drivers are Core Kenya's final deliverables. The project is currently up for review as it tenders for partners to move into the ideation and co-creation stages of the HCD process. The significance of the analysis I have shared in this section is our teams ability to leverage learning from CDT to explore psychological perspectives that influence use of family planning. Doing so allowed the team to create design drivers which researched beyond saturated areas of exploration.

This CDT inspired methodology supported, richer conversations into what motivated the groups of people we were designing for. We were able to better understand the mental pressures people are likely feeling in difficult situations. By doing so we are better able to 'put ourselves in the shoes' of those we design for. At the start of Core Kenya we understood there were significant tangible barriers to accessing family planning. By the end of our analysis, we understood significantly deeper mental motivation for attitudes and behaviors around family planning. In tandem with addressing those tangible challenges solutions must facilitate overcoming the strong mental barriers in place.

If solutions ignore mental barriers CDT predicts, people are likely to reject the new solution and advocate for the current attitudes, beliefs, behaviors, or social norms, even if they are harmful. It is important to address both aspects of tangible and mental dynamics of a challenge. While this thesis focuses on the mental drivers behind a challenge, ignoring the practical realities means CDS's will continue to drive harmful behavior.

The next step from this is to leverage CDT for the positive health behaviors and attitudes. That is, strategically create and dismantle CDS's to facilitate attitudinal, behavioral, and eventually social change. Core Kenya has concluded as a project, therefore I am unable to exemplify this point through practice at the time I have written this thesis. In addition, I will offer informed speculation of how our team could continue to utilize CDT to create solutions. I will also offer examples of how our team could have use some of the tools I have developed through out section 12, in the context of Core Kenya.

## 13.2. Core Kenya CDT Speculative Prospective

If Core Kenya were to move into the creation phase of the design process, the Scope team could further use CDT to ideate solutions from the design drivers detailed in figure 18. I will provide a speculation on how this process could occur. Our team could approach use of CDT in ideation by; exploring potential CDT paradigms at play in the design driver, evaluate potential risks of this paradigm, brainstorm solutions informed CDT dynamics, use CDT to analyze predictive responses, and prototype and iterate.

I will use the following design driver from figure 18, to exemplify how our team might begin to approach design drivers with the use of CDT thinking.

### **Design Driver**

“Reframe manhood beyond existing gender norms: give young men models for positive masculinity and gender equality. Promote taking responsibility of others as part of masculinity” (Gendered Lens on Family Planning Core Kenya, 2020. p18).

Using the CDT knowledge this thesis has covered I will exemplify a thought process of how one could begin to apply CDT thinking in ideation. I will indicate CDT thinking with italics along this process.

Our team might begin to approach this design driver by defining what kind of change the design driver is seeking. In other words, explore potential CDT paradigms at play in this design driver. This design driver suggests we are looking to induce a social and behavioral change by influencing attitudes and beliefs of manhood.

### **CDT Thinking - Analyzing the Design Driver**

*This design driver calls to present young men with “new models for positive masculinity and gender equality” (Gendered Lens on Family Planning Core Kenya, 2020. p18). This means the future solution*

*may present new or opposing ideas of manhood. From our data we understand manhood is among the most highly valued virtues. Therefore the community, and men in particular are likely to strongly reject ideas which are not in line with their current beliefs of manhood. Proposing new ideas of manhood is likely to engage the belief disconformation paradigm and induce a CDS of strong magnitude.*

*The driver also calls to promote accepting responsibility as a principal of manhood. From the qualitative data it is indicated, a mans (typically 35+)responsibility is to be a leader in his home, to provide food, education, and money for his family. Doing so gains men respect and admiration in the community. The at risk young man often wants this social acceptance but not the level of responsibility that comes with taking care of a family. He may likely want to explore his sexuality by having multiple partners or simply one partner without the commitment or promise of more. Both are frowned upon the society and likely by most women he wants to have relationships with. Therefore is likely to advocate for commitment to a young woman and renege that commitment when he must take on the responsibility of his promise. This dynamic may induce both the Forced Compliance and Hypocrisy paradigms in young men.*

I have given a conjecture on the potential CDT paradigms this design driver may engage. This is important to keep in mind as it will help guide the ideation and analysis process of developing solutions. It should also be understood that without testing we can only infer these paradigms are at play, the more information we know the more confident we can speak to the existence of CDT paradigms and dynamics. It is best to present and uses paradigms as guides which are likelihoods, supported by precedent outcomes rather than infallible truth for a behavior. With HCD thinking, knowledge of Core Kenya's qualitative data, and CDT competencies at my disposal I can further find potential risks interventions have if the paradigms hypothesis are at play.

#### **CDT Thinking - Paradigm Risks**

*Revisit figure 9, page 35, to review the predictive responses of Belief Disconformation, Forced Compliance, and hypocrisy paradigms. These predictive responses are the risks new solutions must overcome. Belief Disconformation, is likely to educe a strong rejective response to new or contradictory information ideas, and attitudes about masculinity. The Forced Compliance and Hypocrisy paradigms already at play are likely to mean individuals may comply in the short term to responsibility, but when the pressure or motivation to do so fades, so do young mens responsible behavior in sex and family planning situations.*

The design driver calls for designers to promote positive models of masculinity and responsibility in family planning. This driver has three key thematic components; masculinity, responsibility, and family planning. With these themes in mind, I look to explore areas to brainstorm with in.

#### **CDT Thinking - Brainstorming**

*It is possible to use this perspective on behavior to aid in brainstorming efforts. To do this I might ask the following in no order of importance;*

*When are young men in compliance with social norms of responsibility?*

*What might reinforce young men to continue this behavior?*

*What might make responsibility mentally more habitable?*

*What might make irresponsibility mentally inhabitable?*

*How might we facilitate young men to convince themselves of positive ideas of masculinity?*

*How might we leverage existing positive ideas of masculinity?*

With these questions in mind I could further explore answers to these questions.

### **CDT Thinking - Brainstorming Continue**

*Most men have their own idea of what manhood is. Men in proving fertility at the transactional intersection (where this design driver comes from) are in the early stages of the pursuit of an idea of manhood they have in mind.*

*It is likely that most young men believe that their attitudes, beliefs, and behavior fit some definition of manhood. If one values masculinity then it is unlikely they believe their attitudes and behavior do not represent masculinity.*

*The solution might highlight positive and negative behaviors and attitudes of masculinity and responsibility in family planning.*

*The solution might facilitate men in highlighting these positive and negative behaviors and attitudes themselves.*

*The solution could highlight the communities admiration of positive ways men could take responsibility in family planning.*

*The solution could highlight how to become a man who takes responsibility in family planning if you are not one.*

*The solution could make taking responsibility in family planning "easy".*

*If young men identify their own contradictions between positive and negative masculinity in responsibility and family planning, this may begin to destigmatize positive attitudes and behaviors for sexual health as it becomes 'the masculine' thing to do or way to be. If a significant amount of young men do this it can apply social pressure for healthy behaviors. Much easier said than done. If the young men and the community can identify how some harmful practices in family planning (like avoiding responsibility of a pregnancy) attributed to masculinity is in fact against their own belief that men provide for their family, then*



*this may boost compliance of healthy attitudes and behaviors for family planning. Learnings from CDT would indicate for individuals are more likely to willingly shift their attitudes or behavior if they are able to convince themselves of the need to make this shift.*

*The solution must also make the positive attitude or behavior far more desirable than the negative one, make the negative attitude or behavior far more uncomfortable to hold or perform than the positive one, or a combination of both strategies.*

*To summarize the solution could focus on boosting the attractiveness to positive responsibility attitudes and behaviors linked to masculinity in family planning, and may attempt to make negative attitudes and behaviors more unattractive. The solution may attempt to avoid triggering the belief disconfirmation paradigm by facilitating young men and other community members to identify their own contradictions establish their own pathway to what taking responsibility in family planning as a man looks like.*

With this summary, I will begin to provide an early idea for a potential solution. My focus in this solution is to ideate for the junction between masculinity, responsibility, and family planning, to curb unintended pregnancies that occur as the result of young men avoiding family planning responsibility pursuing ideals of masculinity. The solution will encourage attitudes and behaviors with positive health and wellbeing outcomes in family planning and or make negative ones more uncomfortable or difficult to hold or perform. I will present an early solution idea in ‘what if’ statements. I will then predict possible reactions based on CDT. The solution I will exemplify is as follows;

- What if a creative campaign began where men share their thoughts on what it is to be a man who takes responsibility in family planning.
  - What if this creative campaign also shared the times where men felt they did not act in a way in which a man who takes responsibility in family planning should.
  - What if this campaign promoted a social challenge for people to share how they are a man who takes responsibility in family planning.

This solution is a creative campaign which promotes responsibility in family planning as a part of masculinity and manhood. A campaign like this in Kenya could happen via radio, television, social media and in civic spaces, as these are the areas which spark cultural dialogue in the community. As men share their experiences of what responsibility in family planning looks like and the times they failed to do so in the past, the campaign would bring a call to action for other men in the community to share their experiences. Doing so successfully would begin to shift the perception of a social norm (Young men not taking responsibility in family planning). The campaign would establish a public model of what taking responsibility means as a man in the community and what dodging responsibility looks like. As this campaign builds in popularity the community must begin to collaborate

on how to turn this dialog into action which shifts negative behaviors of evading responsibility in family planning.

### **CDT Thinking - Prediction**

*What CDT dynamics are at play in this solution? And what can CDT predict about the psychological response to this solution. The solution attempts to induce the Hypocrisy Paradigm. An effective paradigm in behavioral change, if engaged long enough (unique to the individual) this can lead to more permanent attitudinal change. This solution facilitates participants of the campaign to trigger their own CDS. When participants of the campaign publicly advocate for responsible family planning and identify moments where they have been irresponsible in family planning a CDS is likely to arise. This CDS does not come from an outside source of new or contradicting information. This solution, if successful, will make apparent to participants and the audience how positive family planning behaviors are more psychologically attractive and negative behaviors psychologically unattractive. In other words, create consonance states around responsible family planning behaviors and dissonance states around irresponsible behaviors in family planning.*

*As established early in this thesis the Hypocrisy Paradigm while effective at temporarily making attitudinal and behavioral changes it is not a permanent fix. A solution should be supported by long term interventions like those popularized in public health. Solutions like sex education, condom distribution, increase in access to family planning methods are all solutions needed to support the change in attitude and behavior I speak of. Otherwise, the community, particularly men, will have a change in attitude and behavior, for example, want to have protected sex but cant access accessible condoms. He is likely to begin risky sexual behavior again. The strategy calls to use the CDT inspired intervention to facilitate a mindset change and provide accessible ways to perform ones mindset change.*

*It is possible for participants to be unwilling to publicly admit responsibility in their past family planning behavior. It is as possible that some of these individuals will join once a wider community takes part in the campaign (it becomes mainstream). This would mean, the campaign has influenced social norms and have begun to influence late adopters. However, because this solution does not force individuals to perform behavior, there will always be some individuals that will not be affected by the solution. Yet, CDT predicts a inducing the Hypocrisy Paradigm is significantly more effective in behavioral change than if the paradigm was not engaged.*

To summarize, This solution calls for creating a campaign which engages the Hypocrisy paradigm to spark an attitudinal and behavioral change among young men. This solution would become apart of a larger system supported by interventions that address the tangible infrastructure of family planning goods and services. As stated earlier, while CDT based solutions address mental motivation designers should also develop tangible solutions to address physical barriers to the challenge.

This is an example of how CDT thinking could occur in the future of Core

Kenya. The idea that designers can use CDT to predict how solutions may perform once implemented, must be tested in an HCD project. This section describes a speculative scenario, of the utilization of CDT for design ideation, if Core Kenya moves into the create phase the Scope team will be able to test the effectiveness of CDT as a predictive tool.

### 13.3. Core Kenya CDT Speculative Retrospective

In this section, I will take a retrospective speculation on how the Scope team could have used CDT thinking and the tools and methods detailed earlier, to help analyze qualitative data to find design drivers. The tools I have shared in this thesis were not created during the time the Scope team was developing design drivers. Therefore I will exemplify how our team may have utilized such tools.

From Core Kenya’s qualitative data, I will utilize the archetype of an adolescent boy (age 15 - 24) whose sexual behavior and relationship with family planning puts him and his partner’s wellbeing at risk. It is important to note this is one archetype of many different adolescents in the towns the Scope team visited. This does not represent all adolescent boys in those towns or in Kenya.

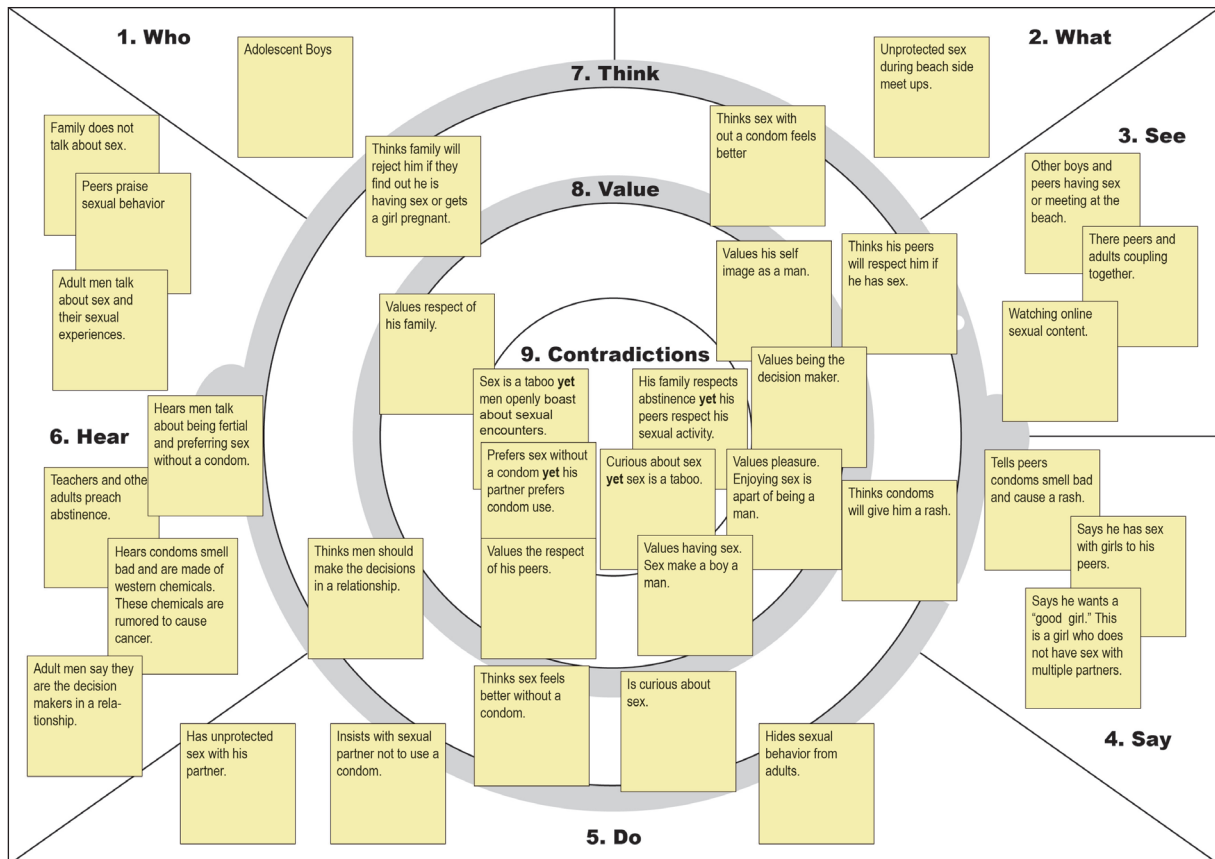


Figure 19: Core Kenya Deep Empathy Map

In this example, the data suggested in this context, pleasure can be one aspect of masculine identity for adolescent boys and men. The communities we research highly valued gender roles and expression of masculinity and femininity, these hold significant weight in one's social acceptance and self-identity. Understanding that sexual pleasure has a potentially significant role in one's identity is a dimension not often leveraged in design interventions on sexual and reproductive health approaches. Our team could have used the Deep Empathy Map to synthesize and analyze adolescent boys' psychological landscape related to family planning. Our data might have been organized as figure 19 exemplifies.

CDT, tells us where there is a contradiction there is potential for a dissonance state to occur, and where dissonance states exist individuals are motivated to reduce or regulate the state. If one can identify a situation where a dissonance state is created it may be possible for designers to build solutions that leverage the motivational state.

The moment where adolescent boys are with a partner and she begins to suggest using a condom is a potential moment of dissonance for the boy. Qualitative data reports the boy is likely to experience a dissonance state. Through research, our team learned adolescent boys make strong efforts to convince their partner to have sex without a condom, get frustrated if his partner persists condom use, and some time may abandon the encounter completely then brand the girl's "promiscuity" as the reason the encounter did not result in intercourse. I will focus on this moment where CDS may develop due to the adolescent's conflicting conditions under which they will have sex or not.

Once a conflict or tension scenario is identified the Dilemma Map can analyze what contradictions the target group is thinking through in a specific situation. By doing so we may better understand how this group is rationalizing their decisions even when the target themselves does not consciously understand the deeper motivations behind their beliefs, attitudes, and behaviors. In the example of adolescent boys refer to figure 20. Here I have placed relevant qualitative data from adolescent boys depicting the moment of choosing between having sex with or without a condom. Areas that are blank like what he might gain what he thinks about, how he feels if he were to choose to have sex without a condom are gaps in knowledge the data does not provide. I could speculate what this side would look like however, its best to get that data from the target group themselves.

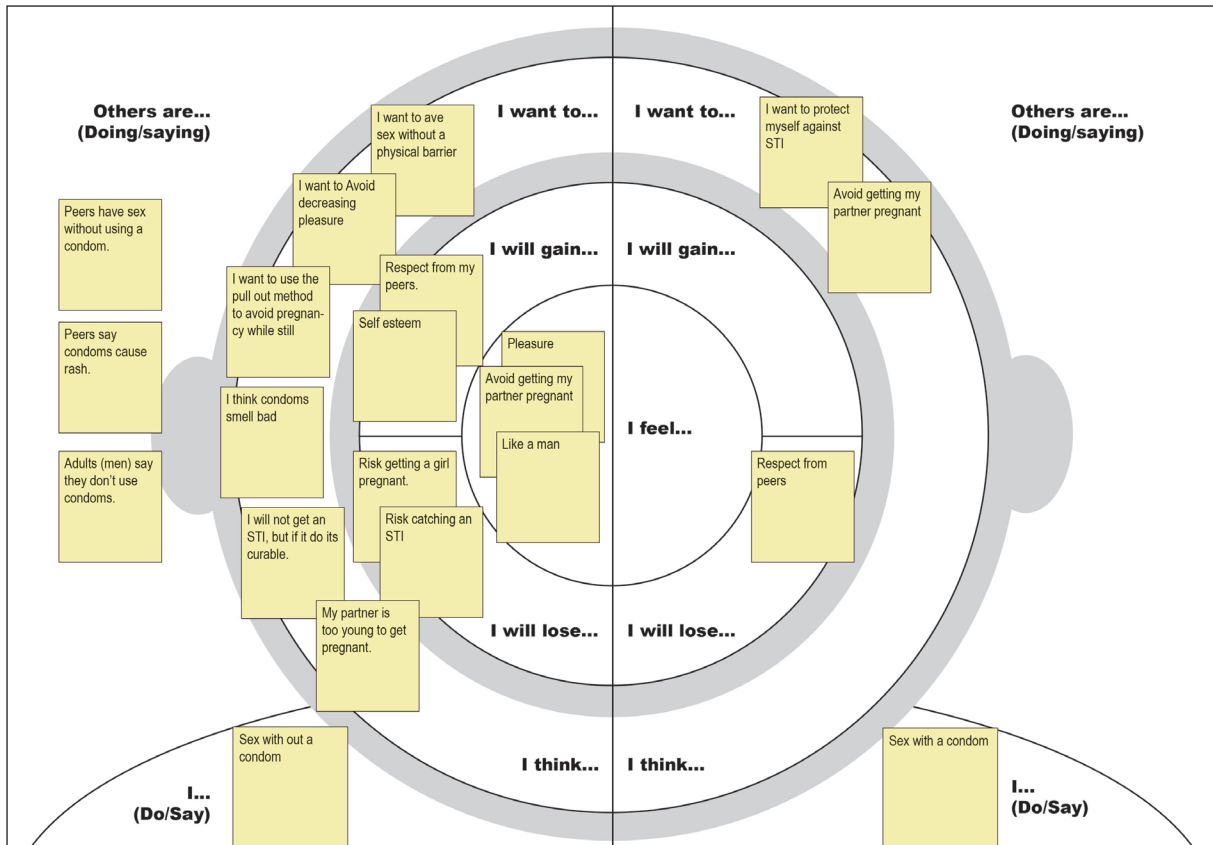


Figure 20: Core Kenya Dilemma Map

By placing what a target group’s thoughts are between two decisions (ideally between the harmful choice and the healthy alternative) It would be possible to draw correlations between why one decision is more attractive than the other on a psychological level. For example, examining what the adolescent boy currently believes he gains when he uses a condom versus what he believes he gains by not using a condom. If he feels like he gains respect from his peers and self-esteem by having sex without a condom, the designer’s solution must understand how much value respect and self-esteem has to the boy, then create a solution which either redirects that source of respect and self-esteem toward the solution or the solution must provide something of greater value. It is important when doing so to remember, this must also be from the boy’s perspective. It is easy for designers to say “he would “gain” by avoiding STIs which improves his health, that is better than respect from peers and contracting STIs.” Understand that this may not be his perspective. Moving forward my team could explore ways to increase his value in his overall sexual health and decrease his value in his peers as it pertains to condom use.

Whether using the Deep empathy Map or the Dilemma Map, the CDT Paradigm Guide could be used to probe and help guide a team analysis in populating either map, or in other structured discussions to better understand potential mental dynamics at work.

After synthesis and analysis, understanding existing solutions through CDT to predict how the target group may respond to existing solutions and identify gaps a new solution could fill. I will continue to use the archetype

of an adolescent boy. An example of this could be the implementation of free condom distribution to promote safe sexual behavior. This was found as a currently implemented intervention in the cities the team visited as a way to encourage safer sexual behavior. I am not arguing against condom distribution, it lowers many key barriers to access to condoms for many individuals. The logic of free condom distribution is simple if condoms are free then everyone has access to a basic sexual health item. At the moment there isn't concrete data to know the effectiveness of Condom Distribution interventions (CDI), these interventions at the moment have no way of linking how many people take the provided condoms to those condoms being used, nor tracking how many non-condom users uptake condom use after implementation of the CDI. Therefore, "CDI may reduce some risky sexual behaviors, but the evidence for any reduction is limited and of low-quality (Malekinejad, Parriott, Blodgett, Horvath, Shrestha, Hutchinson, ... Kahn. 2017, p15-16)".

Look at CDI through the lens of CDT and one can predict CDI's will likely service those in consonance states who want to use condoms and those in dissonance states who want to use condoms but cannot afford it or have concerns about being seen buying condoms. However, a free condom distribution intervention, such as a free condom box, is unlikely to change the mind of a non-condom user who does not want to use condoms. The presence of the condom box (if inducing any relevant mental effect at all) is more likely to engage the belief disconfirmation paradigm as it encourages opposing behavior to the devout non-condom user. The devout non-condom user is likely to develop a dissonance state which induces him to regulate, and because we understand the paradigm potentially at play we can also predict the regulation that is likely to occur. Essentially telling themselves reasons why they don't need or want to take a condom. Therefore, if the goal is to provide condoms for people who want them but cannot get them (for whatever reason) the CDI could be effective. If a community's goal is to induce condom uptake in people who are opposed to condoms, then this intervention will likely fail to achieve that goal. This prediction is supported by CDT and the years of statistical data and research it's built upon. As Core Kenya moves into the creation phase of the HCD process, the team can use CDT and as an early test to predict potential mental and behavioral dynamics solutions may trigger. This is advantageous for strategizing impactful solutions from CDT based insights.

CDT based insight about a young man who opposes condom use (In the Kenya contexts of this case study) might look like the following statements detailed earlier in this thesis;

If the young man faces social stigma from the adults in his community when trying to buy condoms.

He potentially feels embarrassed in front a girl he likes due to lack of knowledgeable of how to apply a condom leaving him feeling emasculated.

Having protected sex means he is not like his peers who are having unprotected sex

### **Insight**

In the short term, unprotected sex is less mentally stressful than using a condom for some young men.

How do we begin to change this perception? Ideally, it would be best to verify this insight with the target group, however, for the sake of this example let's assume that work has been done. This thinking is all done for the outcomes of producing design drivers. Building design drivers from a dilemma might be exemplified in the following three design drivers:

#### **Resolve the dilemma**

Provide a product or service which resolves the dilemma between non-condom use and STI protection.

#### **Moderate a dilemma**

Facilitate ways the target group can make more conscious and informed decisions in moments of deciding when to use or not use a condom that best fit their health and physical needs.

#### **Trigger a dilemma**

Develop a multi touch-point strategy to trigger CDS during moments preceding risky sexual behavior.

By utilizing CDT in this way our team would have an anchor in CDT to help communicate reasonings behind our design drivers and insights. We might explain this to a client as follows;

We anchored our analysis of the qualitative data in not only HCD thinking but used the psychological theory of Cognitive Dissonance to better understand the mental motivations of young men that drive condom use behavior. Using this theory our team could infer young men feel a significant amount of mental discomfort or stress around condom use. This mental discomfort drives young men to seek the path of least mental stress, driving their attitudes and behavior. At the moment despite its negative long-term effects the path of least mental stress and discomfort for young men seems to be non-condom use.

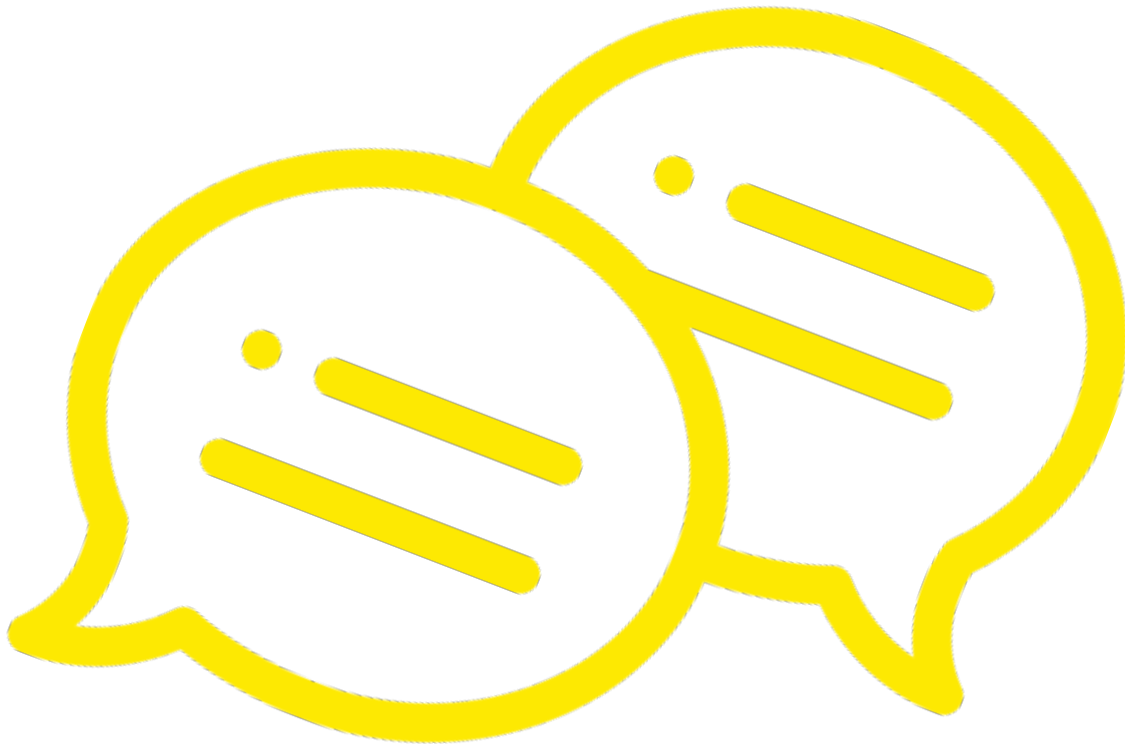
Our design drivers are focused on disrupting this mental discomfort and stress young men feel about condoms and influencing forces. If our solutions can address this mental pressure, they will not only serve a physical need but a psychological one.

To summarize I could have used the Deep Empathy map to better understand the mental dynamics at play within the target group. Doing so would have allowed me and my team to identify what the target group values and what contradictions drive their behavior (We were able to do this however without the structure of this map. However, these insights came about in more convoluted processes). By using the Dilemma Map my team and I could have focused on specific dilemmas (contradictions / CDS's) to create design drivers that may have led to solutions which address the mental motivations of the target group. Ultimately, this process would have allowed our team to create design drivers from CDT and have the knowledge and statistical evidence to show the advantages of leveraging CDT thinking.

# Discussion

As this thesis nears conclusion, this section will reflect upon; all previous sections, their limitations, CDT's contribution to the discipline of design, my concluding thoughts and call to action for all readers practicing and aspiring Human-Centered Designers.

To this point I have introduced the need for Human-Centered Designers to gain greater knowledge of psychological dynamics, outlined what is The Theory of Cognitive Dissonance and how it can be an advantageous knowledge competency for social design projects, defined the theories precedent in public health and design, created tools to utilize CDT, and exemplified the inspiration and use of these tools in a case study.





## 14. Limitation of This Thesis

CDT has promising potential to add value to the HCD process. However, it is not without its limitations. To this point I have two advantages CDT can bring to the HCD process; 1) gain a deeper understanding of the mental dynamics that motivates the people we design for and 2) better predict how to design a solution's impact on those mental dynamics.

If one is to employ CDT based thinking and analyses to a design challenge or solution one must understand key limitations. The first is prediction, one must understand that a prediction is not inevitable. CDT's predictions suggest a significant majority of people are likely to respond in patterns under certain circumstances. However, people and large systems are complex and CDT does not produce infallible prophecies. It is possible the solution performs unexpectedly to what the CDT would predict.

Related to this fact, is the second limitation of the utilization of CDT. Simply put, it is impossible to account for all influential factors (cognitive or otherwise) of the people designers design for and those that influence them. Designers must gain enough necessary relevant data and analysis in order to make informed deliberate design choices for positive impact. This is true for CDT thinking in design, and should not exist in a vacuum. Designers using CDT thinking must do as a complementary competency to classic HCD thinking.

There are two important limitations of this thesis to keep in mind as well. The first is this thesis was written without the consultation of a psychologist. Doing so I would have been able to include a psychologist's perspective on the thinking I have outlined in this thesis. While I have drawn from a number of credited, psychologists and researcher's literature, speaking to someone who understands the dynamics of CDT to share their professional knowledge and perspective from the field of psychology would provide a primary source of verification on the thinking of this thesis as it pertains to CDT.

The last limitation of this thesis is the tools and ideas have not yet been tested in the practical application of a project. Ideally, the benefits to the HCD process I propose in this thesis should be tested in running projects for validation and refinement.

Despite the limitations I have described, this thesis lays out how CDT can apply to HCD to build competencies in psychological dynamics. Beyond this thesis, one can and should take this thinking and the tools further and integrate CDT and other psychological concepts into design education and competency development.

## 15. Contribution to the Discipline

By understanding the dynamics of the Theory of Cognitive Dissonance, designers of HCD can better understand the mental drivers behind the people they design for. By doing so, designers root their reasoning and analysis in the scientifically proven psychological concepts alongside other current design competencies.

What makes this exploration important is it provides a detailed history and utilization description of CDT as well as how to utilize it in design. Often design education provides designers with no formal methodology to understand the mental drivers of people, yet HCD and adjacent design disciplines demand designers to not only understand but solve for these drivers. How can designers claim to understand people without understanding how the mind works? Often designers draw from inductive and abductive reasoning when it comes to understanding people. While these can bring unique perspectives to a challenge, these do not resonate with funders, clients, partners, and stakeholders from highly evidence-based disciplines.

HCD is a discipline of design practiced globally. It has been employed to tackle some of the world's most difficult challenges in (yet, not exclusive to) health, social wellbeing, and government policy. HCD must begin to integrate knowledge of psychological competencies into the vast toolbox of competencies that currently exist. By doing so, HCD designers will communicate design outcomes that are buttressed by evidence-based analytical thinking around what people do, motivations behind why they do it, and why their proposed solution has promise.

## 16. Conclusion

Understanding the Theory of Cognitive Dissonance provides a new competency for designers to understand the people they design for and the impact solutions have on communities. CDT predicts the dynamic of motivational states when inconsistent cognitions are present. Designers can utilize this knowledge to better predict and understand current motivational forces in the people they design for and provide a foundation for predicting the potential attitudinal, behavioral, and social impact of their solutions. Just like other design competencies CDT inspired tools can help designers to apply CDT-based thinking to their design challenge. CDT-thinking allows designers to communicate understanding and reasonings behind why people do what they do on a subconscious level, this makes designers stronger empathizers and champions of people.

Building education of psychological concepts as students of the discipline, and continued training as practitioners of HCD will breed an era of designers that understand people on a deeper level than ever before. Designers encounter The dynamics of Cognitive Dissonance Theory at every stage of the HCD process. With the understanding of CDT and the tools to aid its employment designers can begin to position themselves to better design for humans inside and out. Once the field integrates psychology-based knowledge into its process and competencies of understanding and responding to people's needs, designers can truly call themselves, human-centered designers.

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