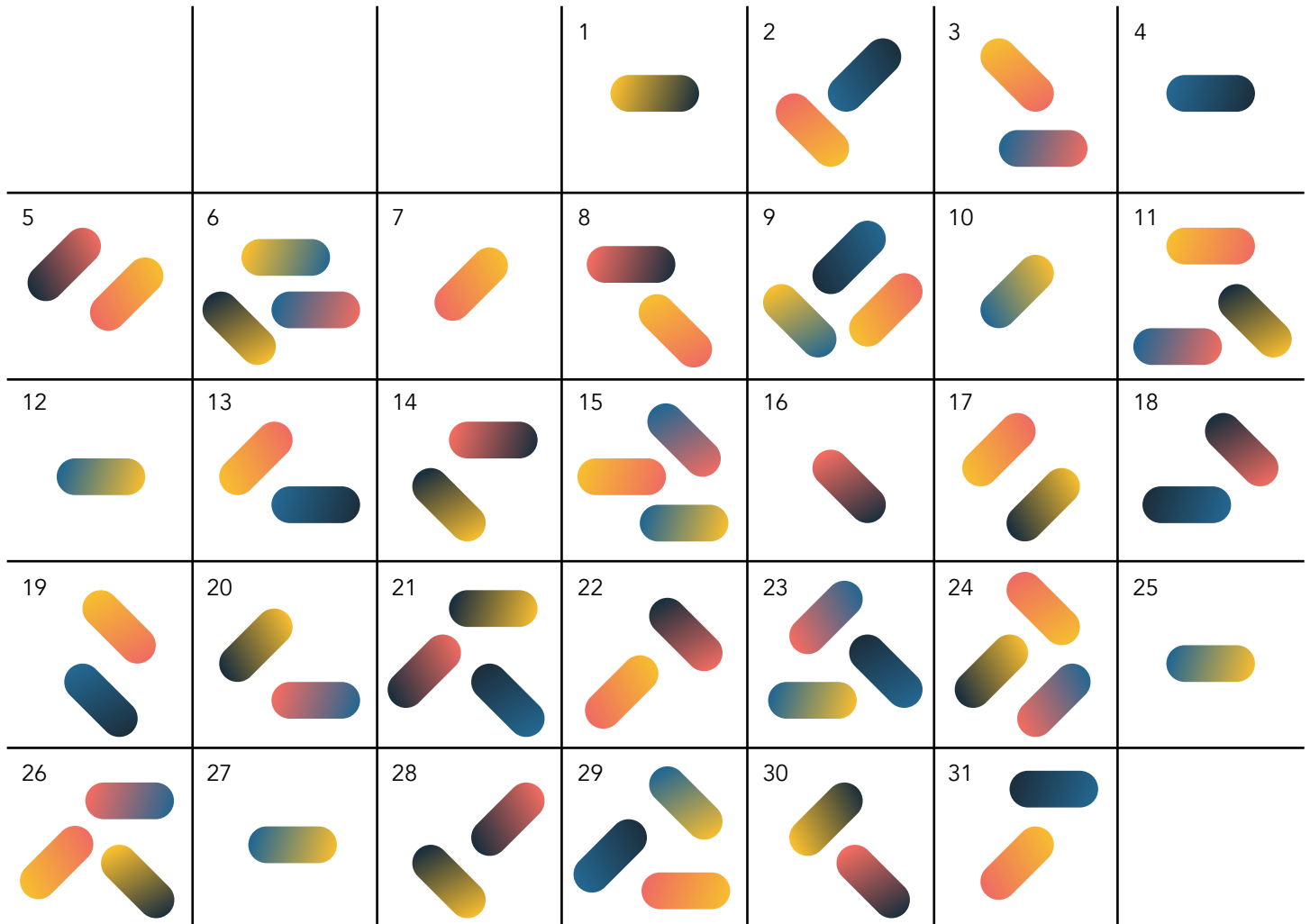


Facilitating the Process of Change

Exploring alternate approaches to behavioural design.



Eric Tsoi
BSc, University of British Columbia, 2017

Supervisor: Eugenia Bertulis

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By

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**A CRITICAL AND PROCESS DOCUMENTATION PAPER SUBMITTED IN
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Abstract

The adoption of healthy lifestyle habits can have a profound impact on individual health and wellbeing on a global scale. This research investigates the use of behavioural insights in interactive digital health technologies, and the potential for these tools to motivate personal behaviour change for improved health and wellness. Explorations into this space have revealed the controversial nature of behaviour change which has motivated a search for alternative methods of facilitating the habit formation process. This shift away from the traditional approach of behavioural design has resulted in one that educates and encourages users to use these behavioural techniques on themselves instead in order to allow human agency to flourish. Design-based explorations that lead to the design of an educational wellness tool and investigates the applications of behavioural insights, using methods borrowed from interaction design, are the focus of this work.

Keywords

Behavioural insights, behaviour change, behavioural design, interaction design, habits

INTRODUCTION

There is a huge ethical debate between manipulation and behavioural design. Through this research I propose an indirect approach to behavioural design which achieves behaviour change through indirect, non-persuasive mechanisms and affords complete agency for the end-user. This work responds to the current state of the field by moving away from the traditional space of leveraging human psychology in behavioural design and using nudges to persuade and manipulate, to a space of teaching users how to apply these behavioural insights on themselves instead. This research was guided by the question of: how can the application of behavioural insights in interactive technologies be used to facilitate personal behaviour change?

What started as an effort to spread the message that habits are medicine through interventions designed to help individuals to build healthy habits, turned into an exploration of the field of behavioural psychology and its influence on interaction design. This research was highly informed by works of B.J. Fogg, Daniel Kahneman, James Clear, and Shoshana Zuboff. The outcomes of this research advocate for a more ethical approach to behavioural design through the design of interventions that make it easier for users to learn and adopt behavioural design techniques. Five design activities are shared in this paper which investigate ways of catalyzing sustainable behaviour change for the promotion of health and wellness in a group identified as the January 1st.

Designing for the January 1st

The first day of the year is a very compelling time to make changes. January first often feels like the one time of the year when everyone joins together to support each other in the mission to improve their lives. The social support received by participating in this annual tradition feels empowering. Exclusive new years offers on gym memberships, deals on fitness equipment and new technologies incentivise those who want the rush of novelty (Ayogo, 2020) and largely benefits capitalist motives. However, this combination of engagement, adaption and novelty only lasts so long. Within a matter of weeks our motivations weaken, new and exciting stimuli get in the way, progress towards our goals diminish and the majority of those who set a new year's resolution are back to where they started.

From our own personal experiences, observation of others, scientific experimentation and the way this topic is portrayed in the media, we know that achieving long lasting behaviour change and adopting new healthy habits is a very difficult task to successfully complete. This research and the interventions that follow are designed to facilitate the formation of healthy habits and routines in those who have struggled to do so in the past. Agnis Stibe (2016) refers to this group as the “January 1st” to reflect the qualities of those who set a New Year’s resolution, only to year-after-year fail to develop the habits that they desire. More generally, this group can also be referred to as the “non-self-determined group” in reference to the Self-Determination Theory of motivation (Ryan & Deci, 2007), and includes those who know that they should be trying to make changes in their lives but do not have the motivation to do so. It is encouraging to note that the January 1st “seem to be the most welcoming towards technology supported behavioral interventions designed to help achieving target behaviors” (Stibe, 2016) and thus provides a great opportunity for designers to contribute positive change. This group will represent our target audience for the research and design work that follows in the sections below.

SECTION 1: HABITS ARE MEDICINE

Conventionally, medicine is chemical, and habits are physical. This research and the interventions that follow are motivated by a desire to effect positive change through the design of tools that provide access to wellness and preventative care. The message that I want to share through the work that I produce is simple: habits are medicine. More specifically, they are preventative medicines. Chronic diseases have become the dominant form of illness and the major cause of disability worldwide (2018). Fortunately, much of this can be prevented through the adoption of healthy lifestyle habits which can have a profound impact on individual health and wellbeing. Eating a healthy diet, increasing physical activity, and avoiding tobacco use can prevent 80% of premature heart disease, 80% of type 2 diabetes and 40% of cancers (2013). Notice that these are not pharmaceutical solutions. These are habits – routine patterns of behaviours that can be adopted into anyone’s daily lives.

Project 1 – Exercitium Rx

An early attempt at communicating this message emerged from designing a fake miracle drug. This project was based on two observations. The first observation was that it often feels like many of us want an easy solution. We typically do not want to go through the grind of developing a new habit that will make us healthier. We want an instant solution and instant satisfaction. The second observation was that there seems to be a dependence on medication in our western culture. Pills, supplements and medicine almost act as a mental safety net that many people depend on or use to justify their behaviours. Thus, I made a prototype of my first project, called Exercitium Rx (note that “exercitium” is the Latin word for “exercise”). Exercitium Rx imagines a world where a pharmaceutical company invents a drug that could deliver all the benefits of physical exercise in one tiny little pill. Using tactics inspired by critical design and design activism, the outcomes of this project are a series of print materials which tells the story of this drug being discovered and laboratory tested, to it being advertised and sold, and speculates how it could be misused in the future (Figures 1-6).

ENGLISH ESPAÑOL 中文

The New York Times

Tuesday, February 26, 2019 Today's Paper

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Books Style Food Travel Magazine T Magazine Real Estate Video

PTZ Your Tuesday Evening Briefing Here's what you need to know at the end of the day.

The Daily Listen to 'The Daily' What Hollywood keeps getting wrong about race.

In the 'Smarter Living' Newsletter 8 things you can do to care for the planet.

S&P 500 -0.08% ↓
Dow -0.13% ↓
Nasdaq -0.07% ↓

6°C
5° -1°
Vancouver, BC

HEALTHCARE

Laboratory Tests for Exercitium Gives Hope for Chronic Disease Prevention

- Exercitium found to release BDNF, endorphins and monoamine neurotransmitters in the brain which can lead to greater mental health.
- Discovery of this miracle drug shows promise for minimizing the risk of developing chronic diseases in as little as 20-30 minutes of prescribed use a day.

1h ago



World Health Organization: Chronic Diseases are the cause of 36 Millions Deaths a Year

Chronic diseases have become the dominant form of illness and the major cause of disability world wide. Luckily, much of chronic diseases can be prevented through adopting healthy lifestyle habits such as eating a balanced diet and increasing physical activity.

Feb. 26

RESEARCHERS

Researchers are rewarded with positive results from Exercitium's double blind placebo tests.
Eric Tsang/Family Care University

POLITICS

North Carolina Republican at Center of Fraud Case Won't Run in New Election

Mark Harris's political fortunes collapsed after the revelation that his



A Strong Start for Kamala Harris, With Some Notable Stumbles

On some issues, the senator has not offered positions when asked, had

Editors' Picks



Habit Pills to Satisfy Everyone's Need for a Magic Pill

A new type of medicine is being designed in Vancouver to help you to adopt new behaviours and optimize your health and wellbeing.

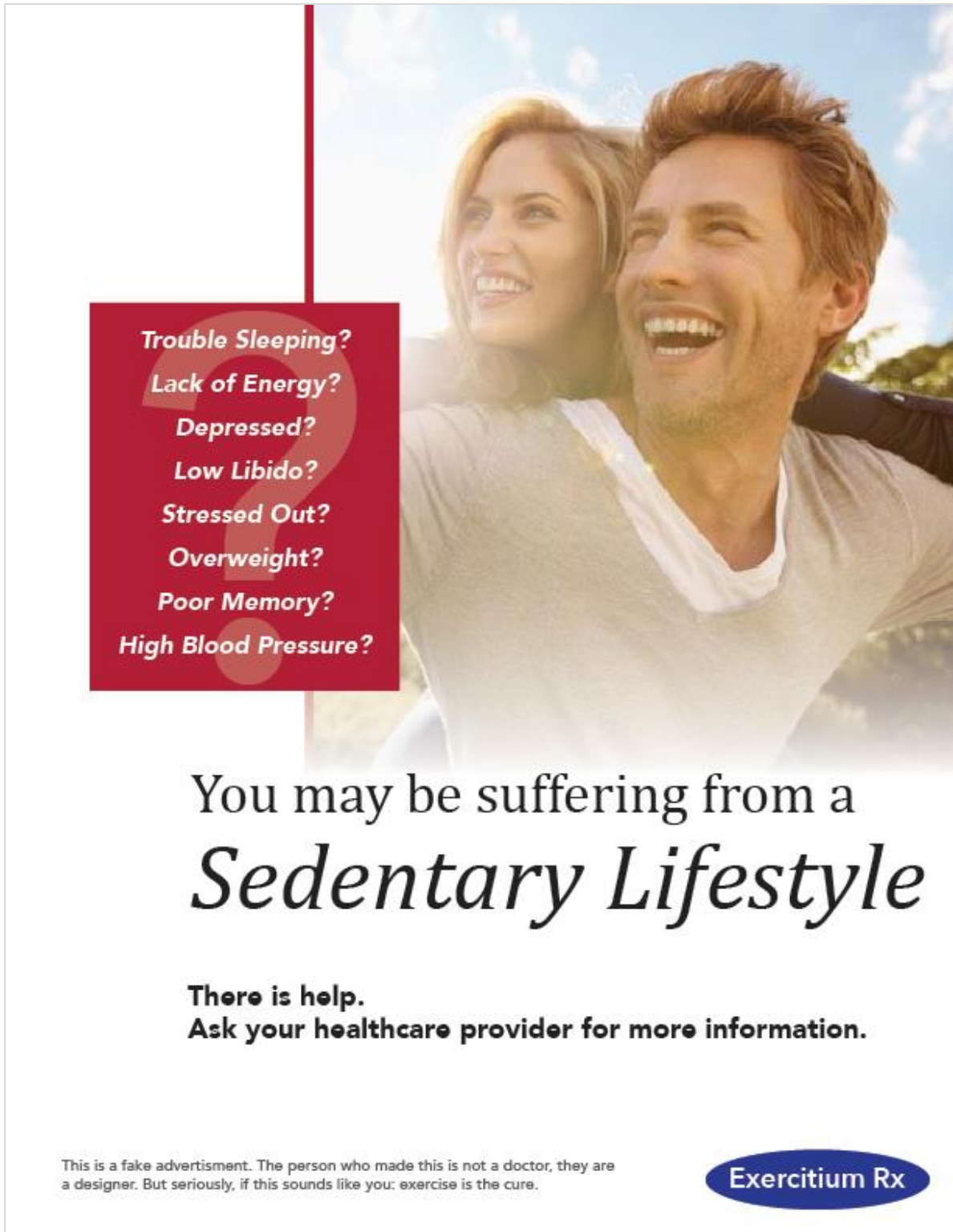
Design 1h ago

Bali in March, Egypt in November: 12 Months of Travel Deals

Everyone knows off-season is the cheapest time to travel, but who wants lousy



(Figure 1 – A mock-up of The New York Times online newspaper highlighting the clinical testing of *Exercitium Rx* in the featured article. The Editor's Pick article is related and hints at the Habit Pill project which was later developed and is discussed in the sections below.)



Trouble Sleeping?
Lack of Energy?
Depressed?
Low Libido?
Stressed Out?
Overweight?
Poor Memory?
High Blood Pressure?

You may be suffering from a
Sedentary Lifestyle

**There is help.
Ask your healthcare provider for more information.**

This is a fake advertisement. The person who made this is not a doctor, they are a designer. But seriously, if this sounds like you: exercise is the cure.

Exercitium Rx

(Figure 2 – Direct to Consumer Advertisement #1. A help-seeking advertisement, advertising Exercitium Rx as a prescription medication and cure to a sedentary lifestyle. Also included is a list containing a wide variety of associated symptoms that exercise is proven to be beneficial for.)



Ask Your Doctor About

Exercitium Rx
(exercise)

This is a fake advertisement. The person who made this is not a doctor, they are a designer. But seriously, if this sounds like you: exercise is the cure.

Exercitium Rx

(Figure 3 – Direct to Consumer Advertisement #2. A reminder advertisement, making it explicit that Exercitium Rx is something that is available for purchase. Including the common name for this medication reveals that this whole campaign is fictional. The hope was that this could help people to realize that exercise is a medicine and something that can provide real health benefits.)



(Figure 4 – An over the counter supplement poster for Exercitium Rx. Continuing with the theme of pharmaceutical marketing, there is the possibility that this magic pill could be sold as a supplement or over the counter medication. When designing this piece, I was imagining what a store like GNC or Popeyes (two supplement shops in Canada) would want to sell to their customers.)

(Figure 5 – Speculative Storyboard #1. A scenario showing how Exercitium Rx may be misused to justify unhealthy eating. This image can be found in the [online version of this document.](#))

(Figure 6 – Speculative Storyboard #2. A scenario showing how Exercitium Rx may be misused to justify having a sedentary lifestyle. This image can be found in the [online version of this document.](#))

Designing this play on pharmaceutical marketing and sharing the results with my peers broadened my understanding of behaviour change. It temporarily shifted the focus away

from using behavioural techniques when designing an experience to change someone's physical behaviours, towards a tactic that changes how people perceive and think about these healthy habits, and the language that is used when talking about them. Instead of using behavioural insights to persuade someone to exercise, this approach attempts to change how people think about exercise (for example, as a medicine) and allows others to observe how they respond to that. Through interviews or observation, these responses could provide an opportunity for designers to identify the cognitive fallacies that may be getting between an individual and the desired behaviour (in this case physical exercise) and provides them with an opportunity to respond by designing a way to correct the fallacy to nudge them towards the healthy behaviour (all the while reinforcing the message that habits are medicine).

Project 2 – Molecular You

A second project that has been instrumental in helping me to understand and share this message is in the work that I did with Molecular You. Molecular You Health Intelligence (MYhi) is a bioinformatics and visual analytics platform that incorporates techniques from personalized medicine to help people to understand their individualized medical trends and provides them with a personalized action plan (composed of behavioural lifestyle interventions) to help them stay healthy. Throughout this degree, I have been leading a project that rethinks the MYhi platform to improve its usability and the comprehension of complex health data and personalized lifestyle intervention information. The goal has been to update this platform, which was originally designed with, by and for scientists, doctors and healthcare practitioners, to make it more accessible for non-medically trained individuals. Research into visual analytics shows that individuals who fully comprehend their results are more likely to modify their health behaviors, share relevant results with their family members, and become more involved in the clinical/ health maintenance decision-making process (Al-Hajj, Pike, Riecke, & Fisher, 2013). This work also builds on Fogg's findings that the perception of a personalized set of results increases user engagement (Fogg, 2011).

Two of the key design changes I led were:

1. A solution to integrate health data and lifestyle recommendations so that users could immediately discover what next steps they could take to improve their health without having to navigate to another part of the platform, and

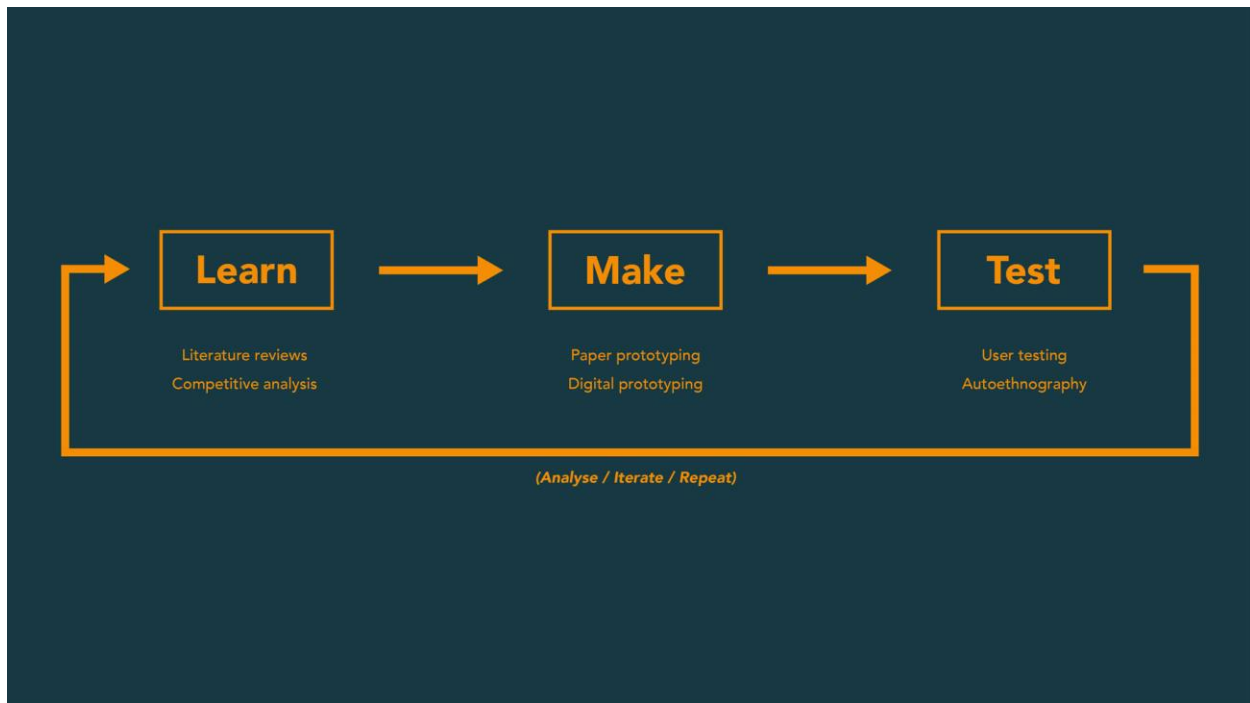
2. A solution to the data overload problem, that was caused by a dense wall of text, to create a user experience that is less overwhelming and more interactive.

(Figure 7 – The old Molecular You dashboard, formerly known as the Health Data Highlights, *which summarized all health data that came back in a user's test in one long scrolling wall of text*. User testing and customer service feedback revealed that this experience was overwhelming and that the content was too dense and difficult to understand without the assistance of a medical professional. This figure can be found in the [online version of this document](#).)

(Figure 8 – The new Molecular You dashboard that was created as a result of the UX Refresh project that I led. It features an integration of both health data and action plan recommendations, all chunked into separate tabs and sections for easier navigation. This content is now written in a more personal tone and at a language that is more appropriate for non-medical professionals to allow for a higher comprehension of information to support decision making by the end user. Previously, no part of the user experience combined both health data and actionable recommendations which left many users during our initial round of user testing wondering what they should do next given their health risks. The need for this integration was also apparent from user testimonials and second-hand feedback from the customer service team. This figure can be found in the [online version of this document](#).)

SECTION 2: LEARN, MAKE, TEST, REPEAT

A constant cycle of learning, making and testing (and not always performed in that order) based on human-centered design, interaction design and autoethnography techniques inform this work. Insights inspired by an early career as a close-up magician, as well as a prior educational background in computer science, human-computer interaction and psychology provide further applied context.



(Figure 9 – An overview of the “learn, make, test, repeat” process that was used in this research. These methods were heavily based on human-centered and interaction design techniques.)

Learn (to understand the theory and problem space)

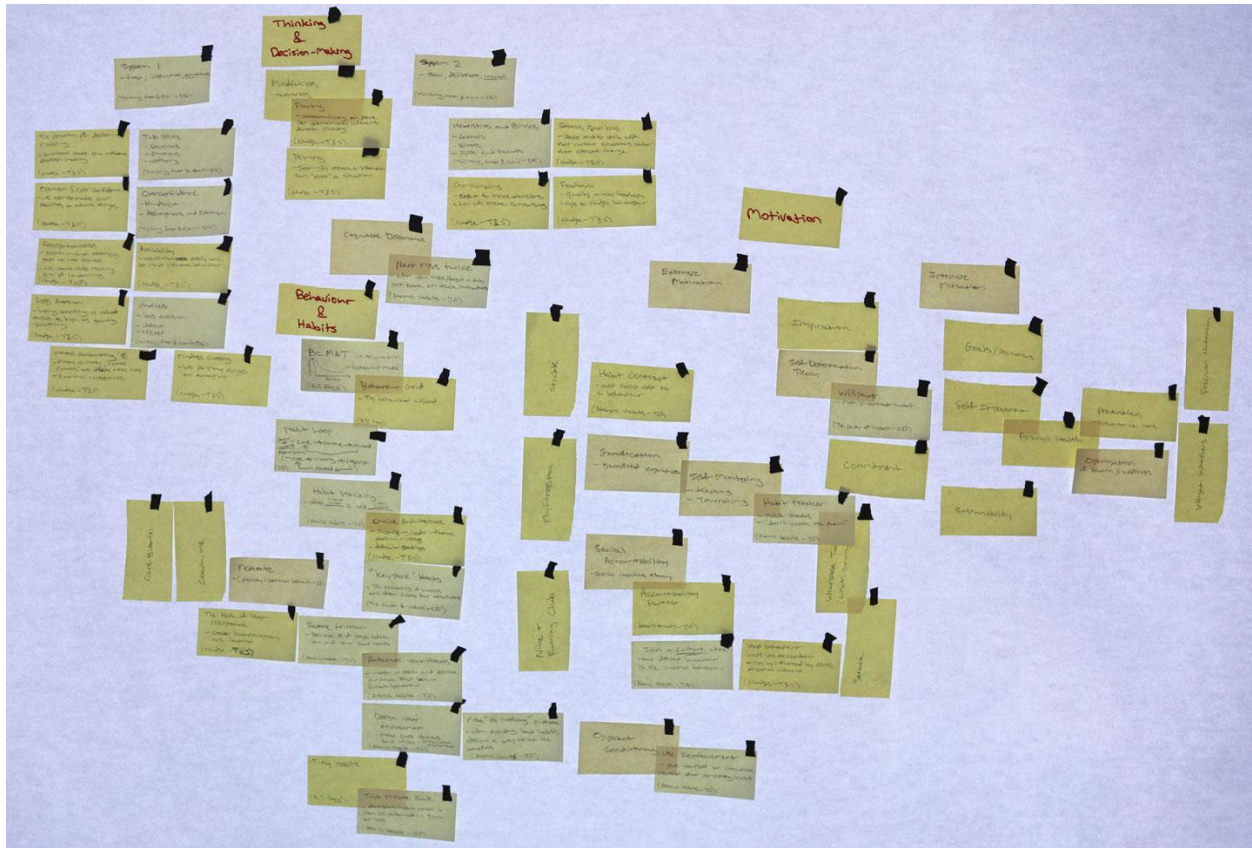
Literature reviews:

A significant amount of time was spent learning the fundamentals of behavioural design, behaviour change science, the process of habit formation and behavioural economics.

These multidisciplinary and intersecting ideas from the literature surrounding behavioural insights have served to not only ground this work in scientific reasoning, but in informing the design decisions made in every step of this project.

Below are some key texts with insights that have influenced my design work. A mind map (detailed further in Figure 10) which included the key points from these resources was created in the early stages of this research to help me understand the wider picture of this field. This initial phase helped me to kickstart this research by providing a diverse array of behavioural insights to work with.

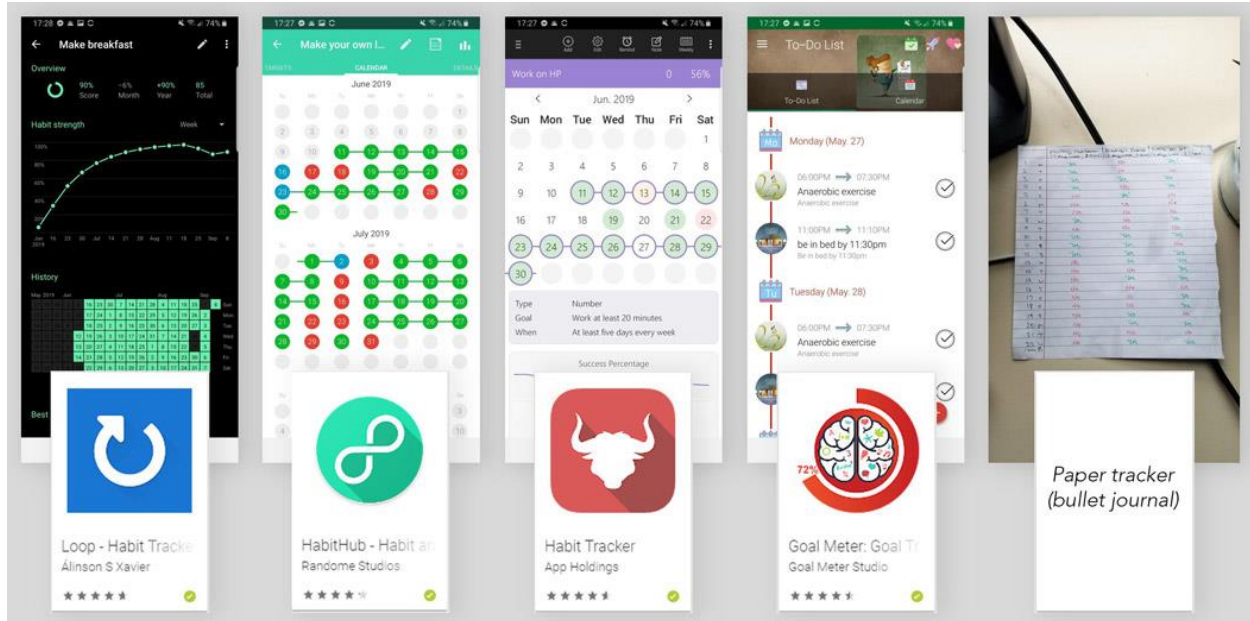
Atomic Habits by James Clear builds upon Charles Duhigg's work in The Power of Habit. Complimentary readings from psychology examining the roles of self-efficacy, self-determination theory and motivational psychology provide additional insights into the process of behaviour change. These works have taught me the process and psychology of habit formation and ultimately led to the idea for the Habit Pill project that is discussed in Sections 3 and 5. Daniel Kahneman's work in Thinking Fast and Slow, and Richard Thaler's and Cass Sunstein's work in Nudge provide insights from the field of behavioural economics that probe at patterns of decision making and their underlying cognitive causes. These influential works informed the Cognitive Bias Trainer project that is discussed in Section 5.



(Figure 10 – A mind map exploring the overlaps in the fields that surround behavioural insights. This mind map includes the key ideas and theses from four books on the topic of behaviour change and habit formation, a handful of academic articles and a few design projects that inspired me. The ideas included in this map were mainly theoretical (more knowledge focused) and tactical (tools, tips and tricks to encourage behaviour change). The hope was that by clustering these ideas together and visualizing where the overlaps were that I could then use those findings to inform the next step of this project.)

Competitive analysis:

In the phase of this project that tackled the creation of a habit application, a competitive analysis which compared the strengths and weaknesses of the top habit tracking applications from the Google Play Store. Four different digital habit trackers and a manual paper journal was tested over the span of 21 days (Figure 11). This activity helped me to identify possible opportunities for improvement within these apps and greatly influenced the design of the Habit Pill application that is detailed in Section 3 below.

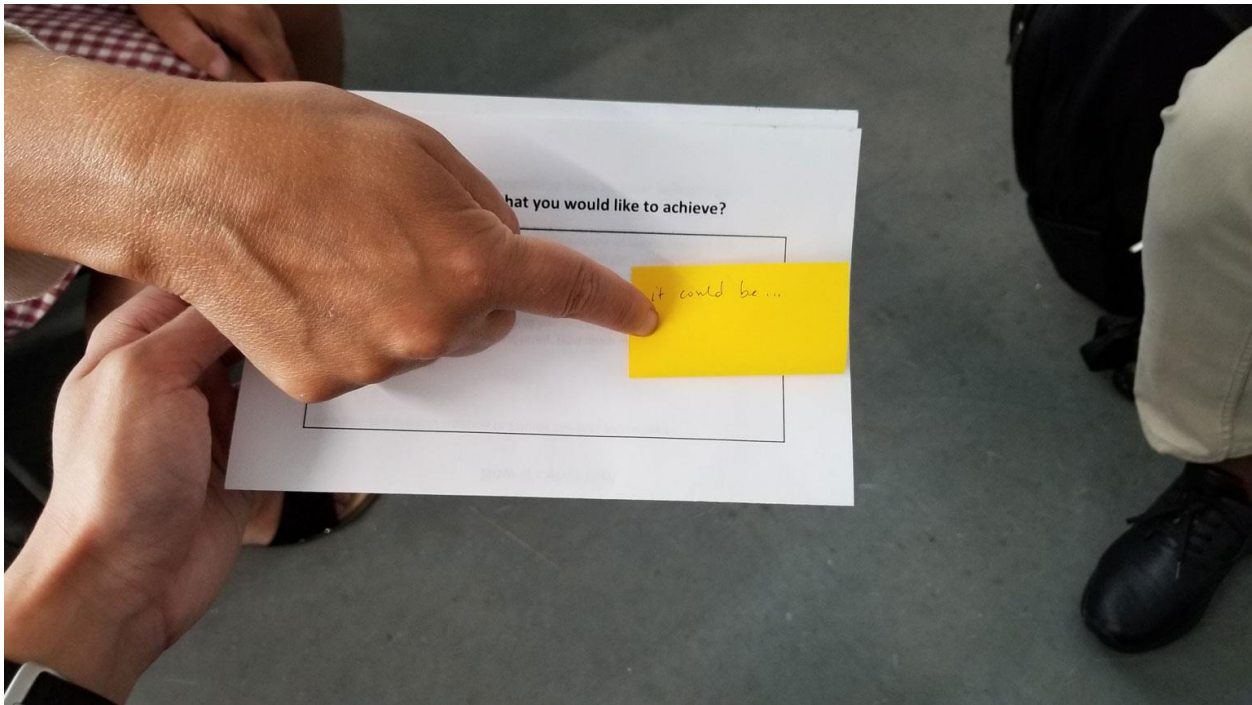


(Figure 11 – Screenshots from four different apps and an image of a manual paper journal after 21 days of testing while trying to build several different habits. Out of these five tools I enjoyed using “Loop” and “Habit Bull (Habit Tracker)” the most due to their easy and well thought out set up processes and the flexibility/ amount of customization allowed when setting new goals.)

Make (to prototypes ideas and apply learnt insights)

Paper prototyping:

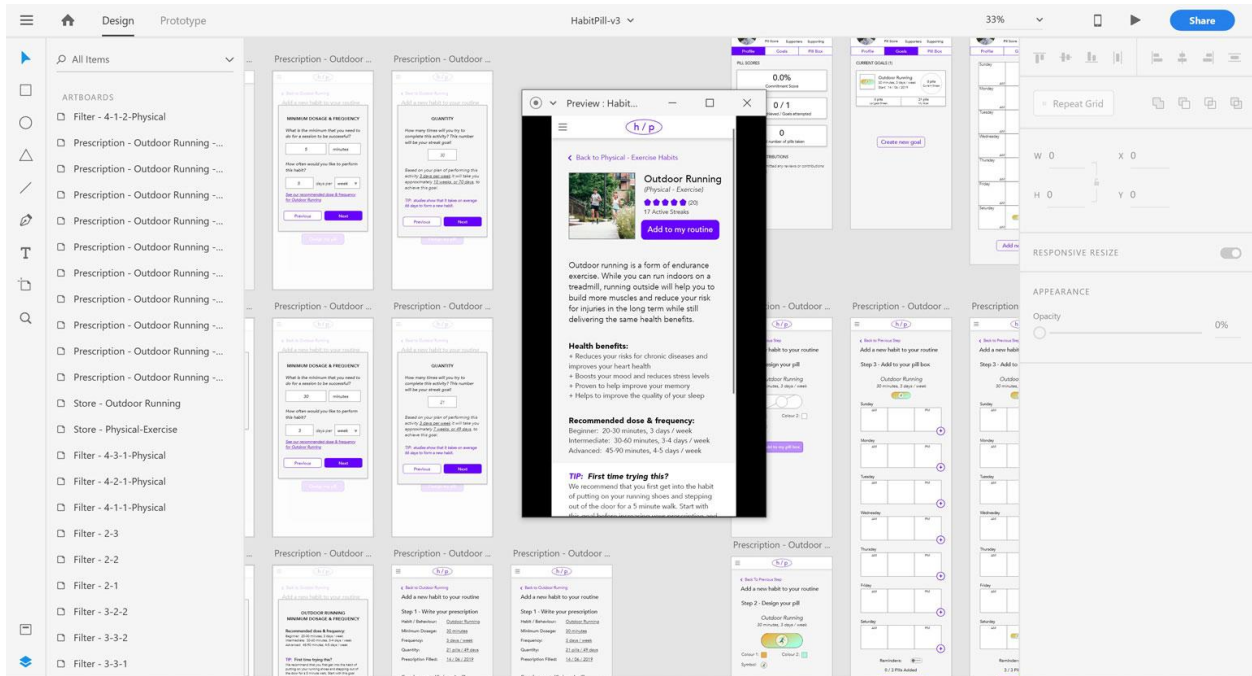
Paper prototyping is a method for quickly modeling an interaction/experience without needing to code or build anything on a computer. Even though the functionality of a paper prototype is often limited, this low-cost method of prototyping allows designers to gain insights much earlier in the design process when there is still room for decisions to be made that can greatly improve an interface, interaction or experience. Paper prototyping was used in the Cognitive Bias Trainer project (Figure 12) and final iteration of Habit Pill (both discussed in the sections below).



(Figure 12 – An example of a paper prototype used in the early stages of the Cognitive Bias Trainer project (discussed in Section 5). In this example the user was prompted to answer the question: “What is a goal that you would like to achieve?” Also pictured is a sticky note representing the idea for a pop-up answer assistance feature that resulted from an impromptu iteration to the prototype (as discussed in the User Testing method below).)

Digital prototyping:

Digital prototypes are often associated with a higher level of fidelity and allows designers to replicate the feeling of the digital environment that the end-product of a project would provide. This method allows for more accurate user testing as a participant can interact with a design that better matches what the final experience will look and feel like, without the designer needing to play the role of the computer as required in other methods. To better envision what a designed experience could look like and allow for more rigorous testing, digital prototyping was used in all the projects produced by this research. To create interactive prototypes that could be used on a laptop or mobile device, these prototypes were created using Adobe XD, Sketch and in some cases the web technologies, HTML, CSS and JavaScript.



(Figure 13 – A screenshot of a digital prototype that was created in Adobe XD for the Habit Pill 1.0 project (discussed in Section 3). In this example a user is using the app to read a description of outdoor running and the health benefits associated with it.)

Test (to validate ideas and the usability of prototypes)

User testing:

User testing was the primary method used to validate the design work generated throughout this research. In this method, participants were asked to interact with a prototype and complete short tasks based on scenarios that reflected the January 1st group which tested different aspects of the design. All participants were instructed to follow a think-aloud protocol to allow the designers and researchers observing to gain a better understanding of their thought processes while they explored the various interactions. Semi-structured interviews performed after the user testing helped to evaluate the usability of paper and digital prototypes and helped to identify critical areas for improvement in the designs. Impromptu iterations of the prototypes often happened after all tasks were completed and allowed participants to contribute their ideas to the design in a co-creative manner.



(Figure 14 – A picture taken during a user testing session for the Habit Pill 2.0 project (discussed in Section 5). In this example the participant was asked to test the set-up process of the app using a digital prototype on a touch-compatible screen which replicated the affordances of a smart phone.)

Autoethnography:

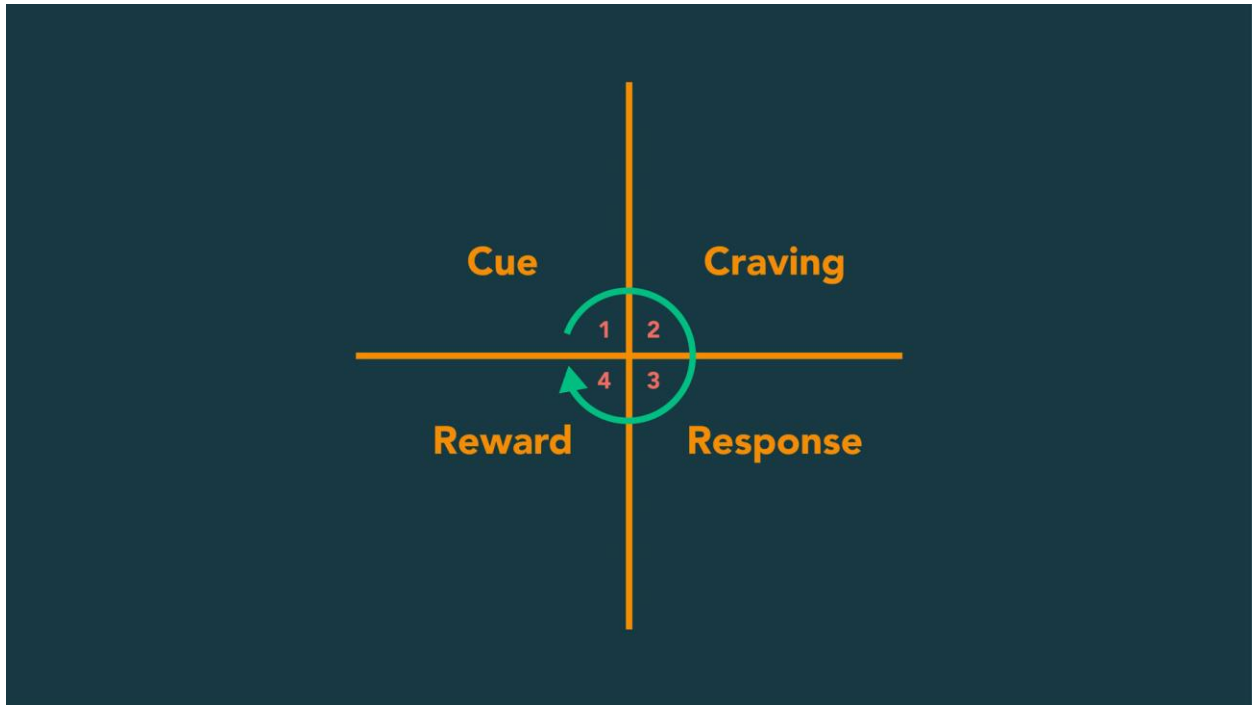
Another source of useful insights that informed this work emerged from the use of autoethnography. Ellis et al. (2011) describes this method as “an approach to research and writing that seeks to describe and systematically analyze personal experience in order to understand cultural experience”. Based on this method, to test the validity of some of the interventions that came out of this research, I would often use myself as a proxy to test if the application of a specific behavioural insight or tool could help me to change my behaviours towards the achievement of one of my wellness goals (for example, experimenting with setting defaults and reducing friction costs in my environment when trying to build the habit of morning meditation). Following this I would later write about my experiences to elicit potential insights. This self-reflective process was particularly useful in the early phases of the Cognitive Bias Trainer project which led to the insight that “your excuses are cognitive biases in disguise” (discussed further in Section 5 below) and in helping me to understand the struggles of those who are trying to build new habits.

An Enhanced lens – Behavioural models as a tool for designers

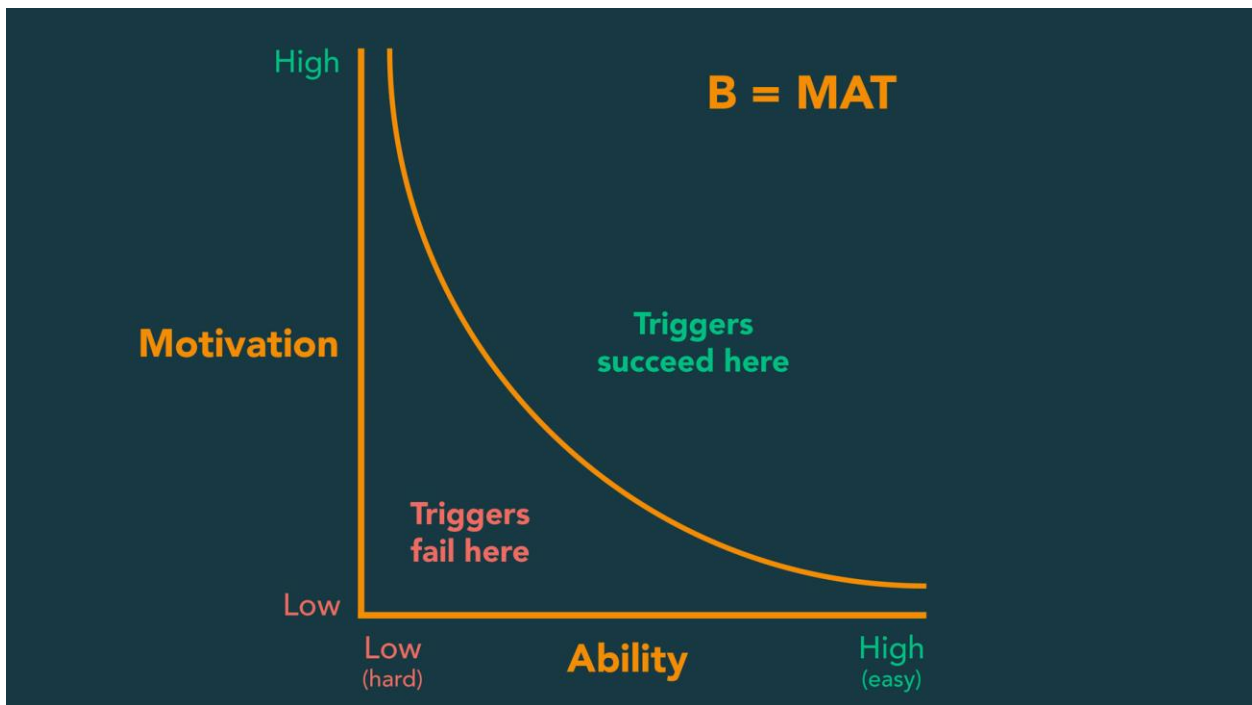
Many behavioural models have helped to progress this work by providing different perspectives to analyse its contents. The Transtheoretical Model (TTM) of Health Behaviour Change states that behaviour change progresses through five key stages (Prochaska & Velicer, 1997) (Figure 16). When used as a lens, the TTM has helped to identify which stages of behaviour change a designed experience covers, and where the opportunities to create a more complete intervention may be. Likewise, the Habit Loop, which describes the four stages that habitual behaviours follow to become habits (Clear, 2018) (Figure 17), and the Fogg Behaviour Model, which states that behaviour can only occur with the right combination of motivation, ability and trigger (Fogg, 2011) (Figure 18), has provided guidance at different stages of this work.



(Figure 16 – The five stages of the Transtheoretical Model, adapted from Prochaska & Velicer, 1997.)



(Figure 17 – The four stages of the Habit Loop, adapted from Clear, 2018.)



(Figure 18 – Fogg's Behaviour Model, adapted from Fogg, 2009.)

Additionally, these models have all helped in understanding the complexity of the those who are in the process of change. For the purpose of this research, we will assume that these individuals, the January 1st or non-self-determined group (our target-audience), fall and stay within the contemplation, preparation and action stages of the TTM. They have a specific goal in mind, they potentially attempt to take action, but if they do, often fail to maintain the behaviour long enough for it to become a habit. In order words, they fail to fully progress from the action to maintenance stages of the TTM.

SECTION 3: THE (TRADITIONAL) DIRECT APPROACH TO BEHAVIOURAL DESIGN

Behavioural insights is a term that summarizes the knowledge gained about the innerworkings of human behaviour from the behavioural sciences (such as psychology, cognitive science, behavioural economics or human-computer interaction). When applied, these insights can be used to “nudge” or influence the behaviour and/or decision-making of a group or individuals (Thaler & Sunstein, 2009). The following sections explore the use of behavioural insights in interactive technologies, and the potential for these tools to motivate positive behaviour change for improved health and wellness. Early investigations led to a better understanding of the habit formation process, and the ways in which designers could create experiences that can help to facilitate this process using techniques based on the traditional or direct approach to behavioural design (explained below).

History and Examples – The current state of the field

My initial research focused on gaining a better understanding of the overlap between two of my passions: psychology and design. The intersection of these two fields that caught my attention is known as **behavioural design** which is broadly defined as a subfield of design that draws on behavioural psychology. Combs and Brown, in their 2018 book *Digital Behavioral Design*, states that behavioural design is “a framework for intentionally and systematically changing human behavior through persuasive modifications of the physical and digital environment”. In other words, the field of behavioural design is based on the idea that you can apply behavioural insights in designed experiences to target human perception, cognition and motivation, in order to effect attention and ultimately behaviour (Wendel, 2015).

The digital design-based outcomes of this practice are often described as **persuasive technologies**. B.J. Fogg, a pioneer in this field, defines persuasive technology as “interactive technology that changes a person’s attitudes or behaviours” (Fogg, 1998). It is important to note that the behaviour change that occurs is accomplished through tactics of persuasion and social influence, not coercion (Fogg, 2002), and occurs as a direct result of an individual interacting with the system. Due to this, this approach will

be referred to as the **traditional** or **direct approach to behavioural design** and will be contrasted to an indirect approach later in this paper.

An example that relates to this problem space of digital health can be seen in the popular activity tracker, Fitbit. This wearable device works by measuring its users' biometric data (such as steps walked, heart rate, and quality of sleep) to help them to reach their health and fitness goals. Mobile companion apps for devices like Fitbit use this data to help motivate users through gamified features such as rewards, badges and points, and gameful features such as streaks and facilitating friendly competition between others who own the same device. Metanalyses investigating the effectiveness of these devices have concluded that although wearables may help to motivate and accelerate physical activity in the short term (Brickwood et al., 2019), there is minimal evidence that they help to improve chronic disease health outcomes (Jo et al., 2019).

A problem with many of these interventions is that features such as streaks, reward points, and social elements all work based on extrinsic motivational factors, which are often counterproductive and are weaker reinforcers than sustainable intrinsic ones (such as learning or reasons for wanting to improve your health) (Benabou & Tirole, 2003). As a result, these systems have the potential of leading their users to unhealthy addictions (Alter, 2017) if the rewards and artificial goals (such as having to walk 10,000 steps a day) do not represent some value to the participant that is outside of the intervention/ product's ecosystem (Ayogo, 2015). So instead of achieving health goals based on commitment to the intervention, facilitated by the rewarding satisfaction of progress towards mastery and meaningful outcomes (Ayogo, 2015), instead, many users get caught up in the obsessive game of maintaining their streaks, checking off boxes to collect badges or in trying to out compete their peers which may be to the detriment of their overall health if the system's design prioritizes these features.

A second problem exists due to what psychologists refer to as hedonic adaption (also know as the "hedonic treadmill" as coined by Brickman and Campbell (1971)). This behavioural insight describes how individuals maintain a constant level of happiness despite changes in their environment and explains why the impact of emotional events reduces over time (Brickman & Campbell, 1971). This natural psychological mechanism can partially explain why many people lose interest in their new year's resolutions only after a few weeks and can also help us to understand why people often stop engaging with their new wellness devices after the same amount of time. Ayogo, a digital health company in Vancouver, uses this insight to factor in the consequential problems of

fading feelings of novelty experienced after some time of using a new app when designing their behavioural interventions. According to their findings, engagement with new interventions peak within the first two weeks of use and slowly reduces as the motivation gained from feelings of discovery, novelty and connection fade away due to hedonic adaption. To combat this, their interventions include gameful elements that are meaningful to users and follow design patterns that promote feelings of utility, safety and mastery to drive engagement past this time period (Ayogo, 2020) (Figure 19).

(Figure 19 – A visualization showing the correlation between novelty, utility and engagement over time. This figure can be found in the [online version of this document](#).)

While fitness trackers such as Fitbit are popular interventions in the space of health and wellness, behavioural design techniques are also being used in other fields. Government agencies have adopted these methods to motivate sustainable behaviours, increase public engagement, safety and crime prevention (Thaler & Sunstein, 2009).

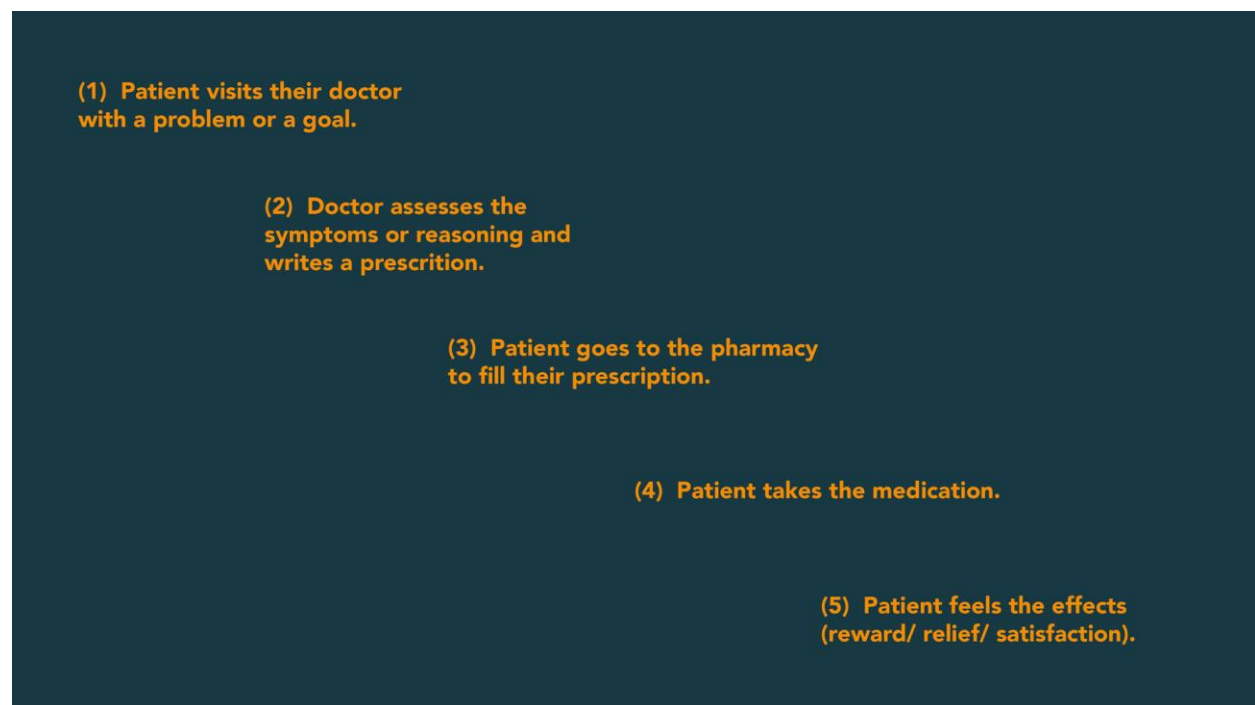
While the examples presented so far have seemingly been designed with ethical intentions in mind, behavioural design techniques have also been used in adverse ways. The effectiveness of these solutions in capturing a user's attention has led to the rise of the attention economy and drives the state of surveillance capitalism (Zuboff, 2018). Books such as *Hooked – how to form habit forming products* (Eyal, 2013) have been popularized and adopted based on the need in tech to compete with others in a battle to control peoples' behaviours and their attention, or as Tristan Harris (2016) puts it, "the race to the bottom of the brain stem", to reflect the neurophysiological mechanisms of addiction. I explored what an ethical approach to behavioural design would look like and will continue this discussion in Section 4.

Project 3 – Habit Pill 1.0 (HP1.0)

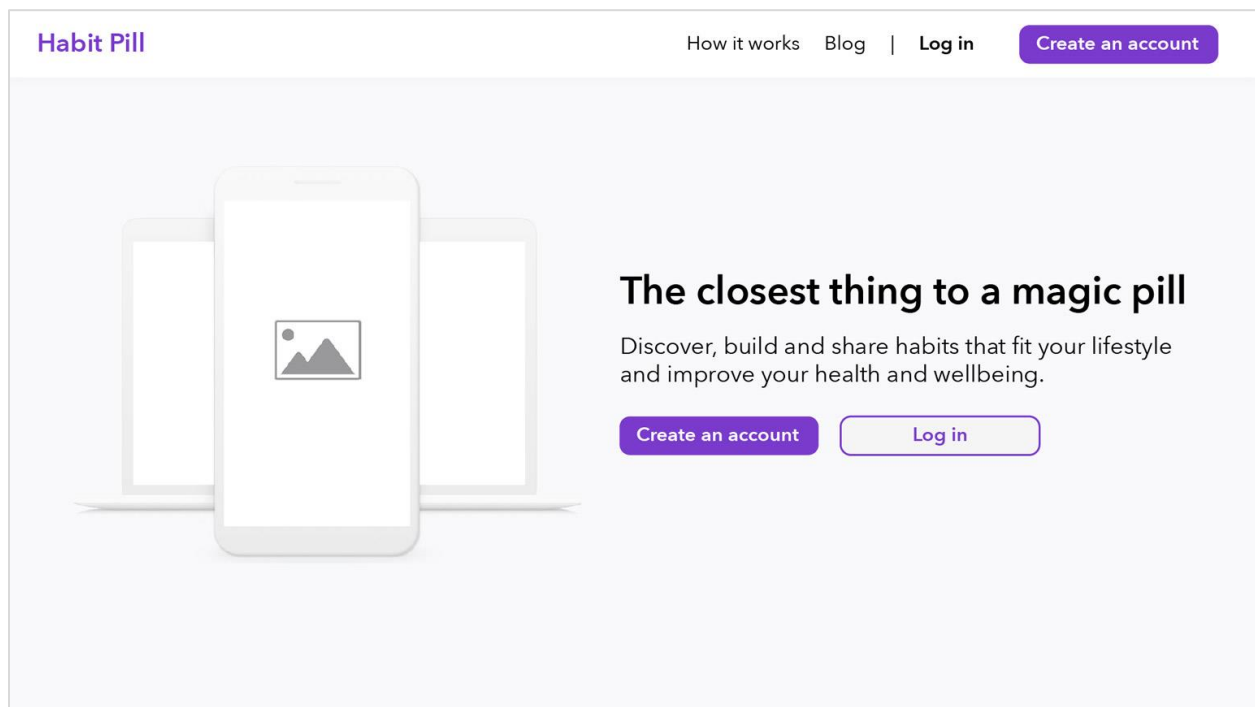
This third project that is discussed in this paper explores the direct approach to behavioural design. Habit Pill (HP1.0) was originally designed to be a social wellness network, that allows users to discover, build and share habits that fit their lifestyles' and improve their health and wellbeing. This project was born out of the insights from my *Exercitium Rx* project, introduced in Section 1 above, which used critical design tactics in a communication design medium to get people to think about exercise as the perfect

medicine. HP1.0 was an attempt to capture all habitual activities that contribute to wellness as a medicine, in a tool based on behavioural insights, that could help users to take the first step of building self-prescribed habits into their daily routines. Another inspirational precedent was [stickK](#), a behaviour change tool that is based on the principle of loss aversion from Yale University. The initial plan for HP1.0 was to create the “ultimate habit tracker” – a tool that would incorporate as many useful behavioural insights into its design as possible to help people to achieve their wellness goals. This tool would not only help you to track your habits but would be effective in helping you to change your behaviour using conventional behavioural design techniques (ie. through the direct approach to behavioural design).

The user-flow for HP1.0 is modeled after the ideal process that a patient goes through to obtain a prescription medication from a doctor: the patient-to-prescription flow (Figure 20). Based on the best practices for building new habits as suggested by Atomic Habits (Clear, 2018), The Power of Habit (Duhigg, 2014), and other literature on behaviour change, I sketched out an experience that could model the patient-to-prescription flow using a conversational UI and applied some of ideas recommended from the readings. I then created a set of desktop wireframes that better visualized this experience (Figure 21).



(**Figure 20** – The patient-to-prescription flow. This flow that I identified through reflection on prior experiences is a five-step process. First a patient visits their doctor because of a problem or a goal. Second, the doctor *assesses their patient’s symptoms and writes* them a prescription. Third, the patient visits a pharmacy and obtains the prescription medication. Fourth, the patient takes the medication. Finally, fifth, the medication kicks in and the patient feels the associated effects or rewards of taking it.)

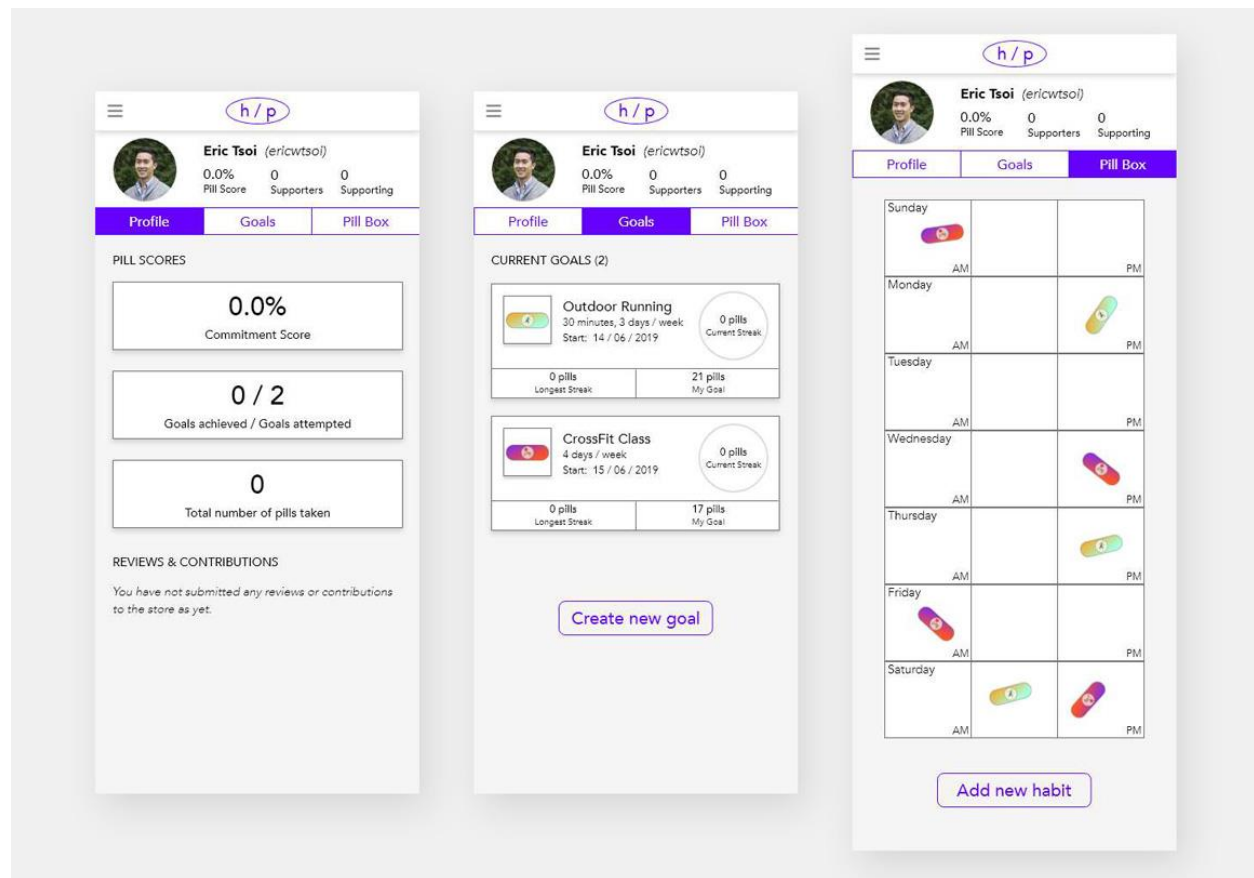


(**Figure 21** – An image carousel containing the Habit Pill 1.0 Desktop Wireframes. Additional images from this carousel can be found in the [online version of this document](#).)

An iteration of Habit Pill reimagined the experience as a mobile application and resulted in an interactive digital prototype that was produced using Adobe XD. This iteration of HP1.0 was informed by a competitive analysis that was performed on the top rated and most downloaded mobile-phone habit apps, some exploratory conceptual design work and user testing. This prototype was designed to demonstrate the process of “designing a pill” (Figure 22) and modeled what a user’s profile could look like (Figure 23). From James Clear’s (2018) work in *Atomic Habits*, and BJ Fogg’s (2012) work in *Tiny Habits*, I learnt that it was important to have a very specific goal and that it is most effective to start with the smallest behaviour possible when trying to build a new habit (for example, if you want to start practicing meditation, start by building the habit of sitting down for 1 minute of mediation and slowly progress from there rather than jumping straight to 20 minutes). Consolvo et al. (2009) strongly recommends goal setting as an effective

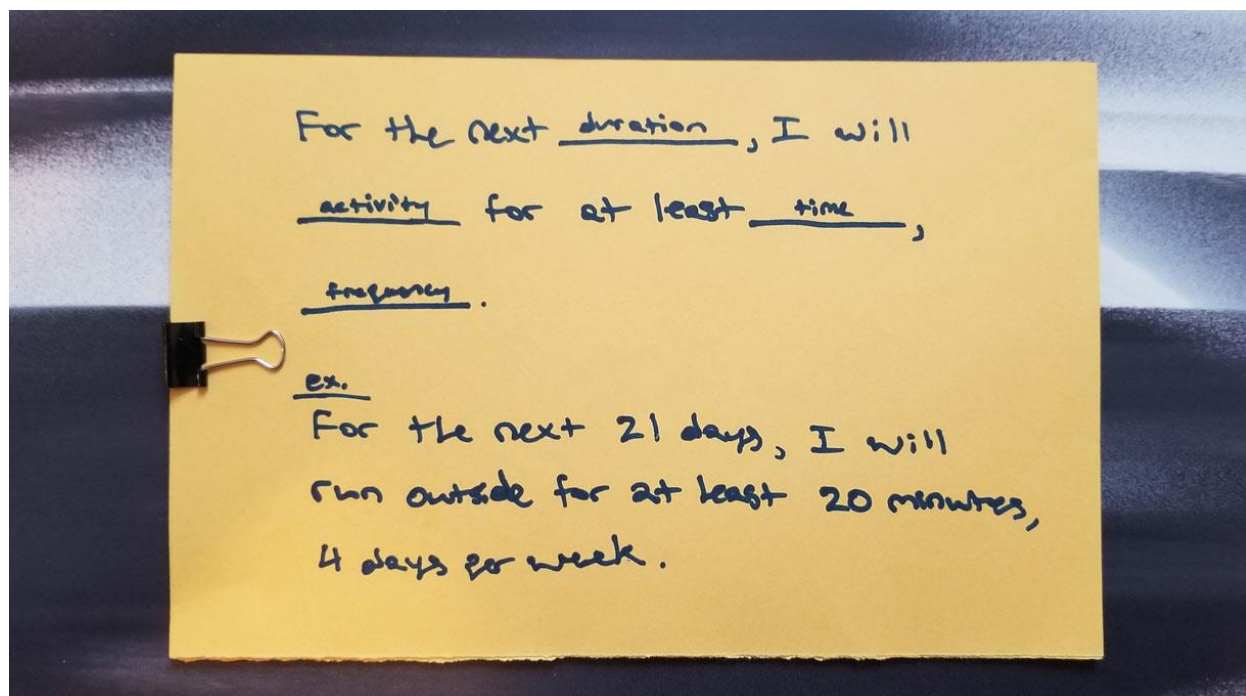
method for changing health related behaviours. Based on these two insights, when iterating on the user experience of the desktop prototype, an emphasis was put on guiding users through the best practices of writing of an implementation intention (a form of goal setting) that is optimized for habit formation and resulted in the part of the user flow known within the app as “designing a pill”. The format for this implementation intention was based on the instructions given in Atomic Habits (an example is shown in Figure 24). Further applied behavioural insights prototyped into HP1.0 were reminder settings that provide simple nudges, gamified elements such as streaks for extrinsic motivation, and followers who provide social accountability for additional motivation.

(**Figure 22** – A video demonstrating the process of “designing a pill” in the mobile version of Habit Pill 1.0. This user-flow helps a user to a first find a habit based on their problem or goal, then write an implementation based on their chosen habit and results in a visual graphic that represents their goal. Once a user’s goal is set and their pill has been designed, the bare minimum of the set-up process is complete. This video can be found in the [online version of this document.](#))



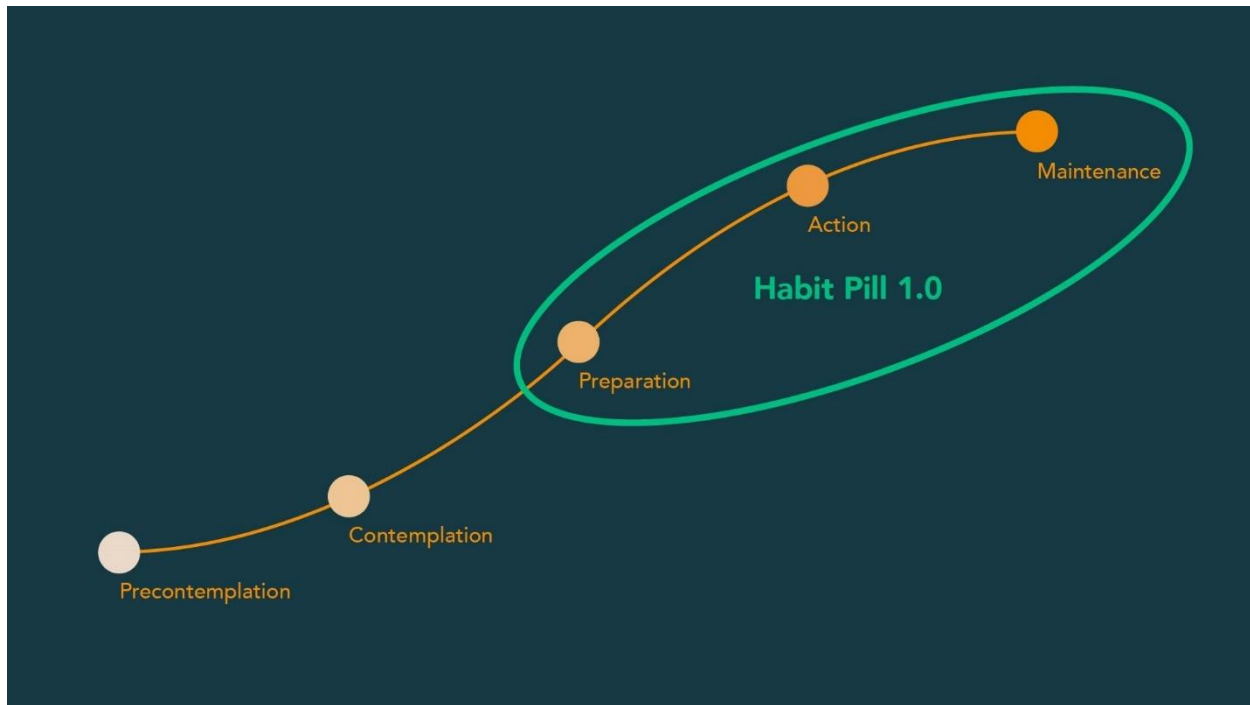
(**Figure 23** – A user’s profile in the mobile version of Habit Pill 1.0. The first tab (“Profile”)

provides statistics and streaks to facilitate behaviour change through extrinsic motivation, the *second tab* (“Goals”) contains a list of goals/ pills designed by the user, and the *third tab* (“Pill Box”) displays a digital pill box that acts as a visual progress tracker (similar to a calendar used to track habits). Users also have supporters (ie. followers) who provide social accountability which helps to motivate people to stick to their goals.)



(**Figure 24** – The format of an implementation intention in Habit Pill as based on the insights from James Clear’s 2018 book *Atomic Habits*. This format combines Clear’s “2-minute rule” and goal setting recommendations to help individuals to commit to a specific, easy to achieve goal in order to build stronger habits.)

Written reflection and user feedback showed that this experience is strong in applying behavioural insights specific to the process of habit formation, but is weaker in the awareness and educational pieces that can advise someone on why they should be adopting habits in the first place, or what the right habit (or level of habit) is for them. To put this another way, when using the transtheoretical model as a lens to analyse my work (see Section 2, Figure 16), HP is strongest in nudging people from the preparation to action, and action to maintenance stages of behaviour change (Figure 25).



(Figure 25 – Habit Pill 1.0 as it relates to the stages of change of the transtheoretical model. Arguably this experience also touches on the prior stages of the TTM (precontemplation and contemplation), but it assumes that a user is already aware that they need to make a change in their life, and they have a minimal understanding of what area of wellness that change affects (for example, physical vs. intellectual wellness), hence they have opted into downloading and using the app.)

HP1.0 was my first attempt at tying together many behavioural insights into an interactive tool that could help users to discover and build wellness habits based on a personal goal or problem. This project also left me with some unanswered questions that were worth further exploration. In relation to the motivation aspect of Fogg’s behaviour model, the last step of the patient-to-prescription flow, the reward stage of the habit loop and the maintenance stage of the transtheoretical model: how can an interactive digital experience help to create rewarding experiences from tiny (pill-sized) behaviours that help in the formation of habits and consequently the maintenance of behaviour change? Furthermore, in relation to the preparation stage of the transtheoretical model, the cue to craving stages of the habit loop, the ability portion of Fogg’s equation, and the prescription stage of the patient-to-prescription flow: how can a digital tool help a user to pick the right habit for their unique personal problem or goal in their unique setting? Can a conversational UI be used in combination with storytelling to facilitate this process?

SECTION 4: ETHICAL PERSUASION

It is clear from recent media highlighting Facebook’s rise and fall, the interference in political elections, and our society’s growing addition to technology that we are being manipulated in ways that very few of us understand. Technologies based on behavioural insights can evidently be used to manipulate our behaviours, but when is it ethical to use these techniques or put these experiences in front of users?

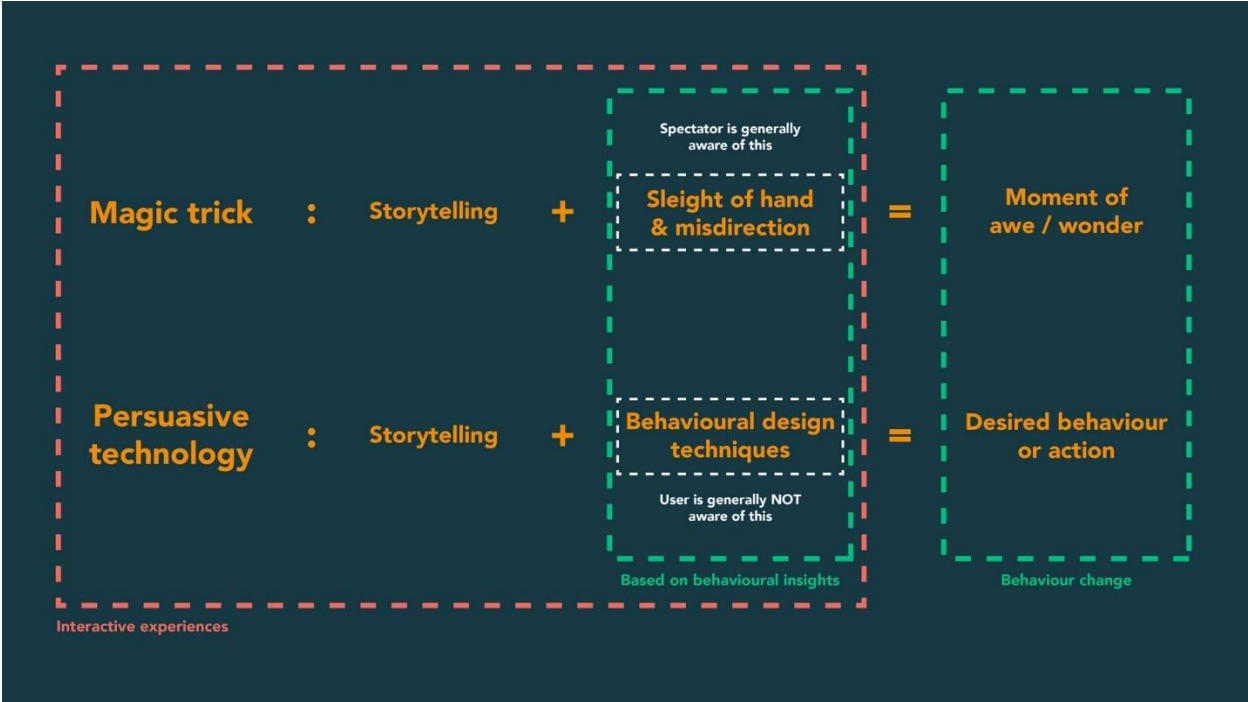
Magic as Consent – Deconstructing magic and persuasive technologies



(Figure 26 & 27 – Two images of the author performing close-up magic at different events in Maple Ridge, British Columbia. Both images were taken during the summer of 2015.)

My interests in design and psychology stem from my early career as a close-up magician (Figures 26 & 27). Reflecting on my experiences of practicing and performing magic has led me to believe that the practices of magic and interaction design have instructive overlap. Both create interactive experiences based on principles of storytelling and use behavioural insights to capture and misdirect attention. Just as magicians use sleight of hand, interaction designers use “sleight of mind”, and both are based on techniques informed by insights into human behaviour and attention (Figure 28). There is an interesting contextual difference between magic and interaction design.

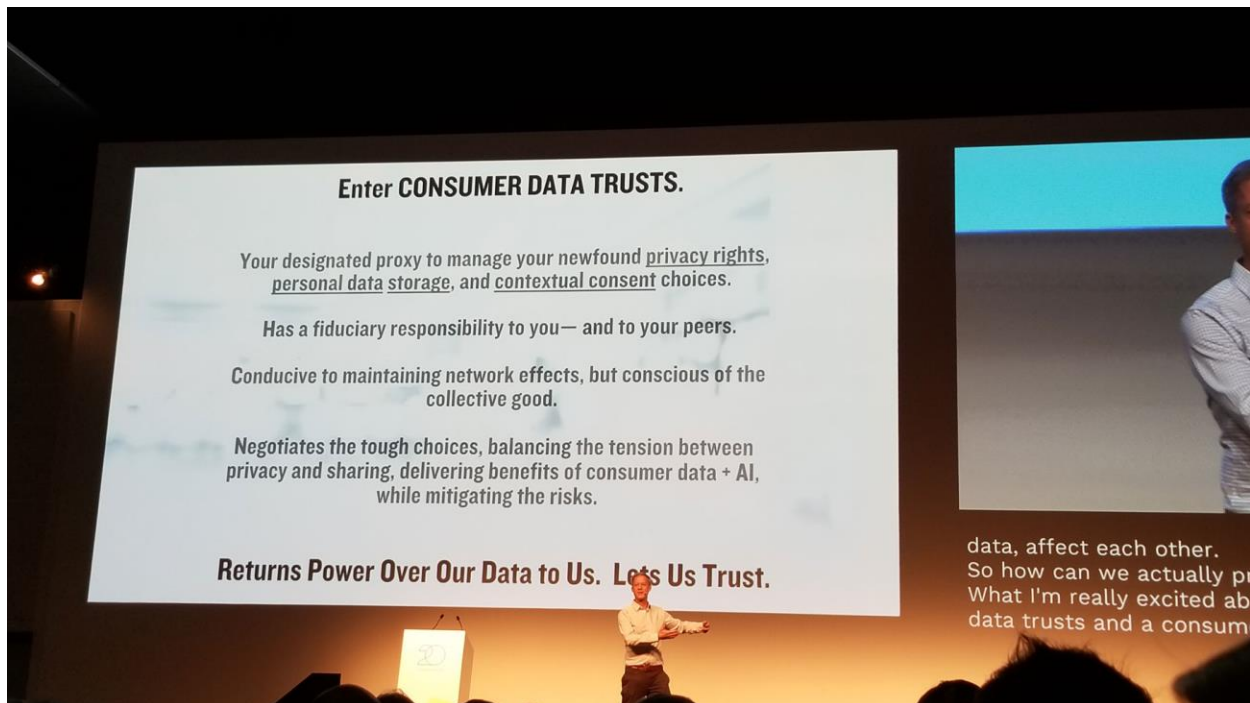
A spectator in the audience of a magic trick has an unwritten, predefined understanding going into the experience that one's perceptions and beliefs are going to be manipulated in exchange for wonder and awe. From a societal perspective this is acceptable because the spectator generally understands this fact, so they provide informed consent to participate in the persuasion and manipulation when they agree to participate in the performance in order to receive the rewarding experience of magic in the end. In contrast, in the design of persuasive technologies it is a different story. Many users are not aware of dark patterns and manipulative behavioural design techniques. For example, the average user typically does not enter a website or use an app knowing that the product company who designed it is using behavioural insights to keep them scrolling or is secretly nudging them towards clicking on different buttons. This makes me wonder: just like how magicians are transparent about their use of slight of hand, what if companies and designers were also transparent about their methods and allowed users to opt-in to their form of "digital magic" in exchange for their product or service?



(Figure 28 – A visualization that deconstructs magic tricks and persuasive technologies to compare these two interactive experiences.)

Data and Trust – Issues with the behavioural surplus

There are many concerns that surround this controversial field of behavioural design. Throughout this exploration I have learnt more and more about the problems persuasive technologies have afforded and what effect this technology has had on the personal data economy. In her influential book, *The Age of Surveillance Capitalism*, Zuboff writes “...although some of these data are applied to product or service improvement, the rest are declared as a proprietary behavioral surplus, fed into advanced manufacturing processes known as ‘machine intelligence,’ and fabricated into prediction products, that anticipate what you will do now, soon, and later” (2018, p.8). In other words, there is so much personal data that is being collected by modern technologies that it has become a commodity in the digital market. Andrew Hoppin reiterated this message in his talk, *(Data) Trust is the New Oil*, presented at the Interaction 20 conference in Milan, and explains how this data is fed into artificial intelligent systems which allow them to make better decisions about you than their human counterparts. This allows certain products to make predictions to know what you want to buy or what you want to watch well before you do in order to make personalized recommendations that keep you in their systems. Hoppin (2020) advocates for a redesign of the personal data economy that is optimized for trust to solve these issues. He says that providing contextual consent is one solution and that implementing data trusts that are controlled by a fiduciary entity could be another, to allow individuals to control what can be done with their personal data and who can access it.



(Figure 29 – Andrew Hoppin explaining the benefits of data trusts during his keynote at the Interaction 20 conference in Milan, Italy on February 6th, 2020.)

Simply put, the systems that we design should afford users the right to their data and not take advantage of it for economical motives. If systems can be designed to only collect the data that is necessary to improve their own products, with the users' consent, I think this will bring us at least one step closer to fixing the larger issues associated with behavioural design techniques.

SECTION 5: THE INDIRECT APPROACH TO BEHAVIOURAL DESIGN

Reading vs. Doing – self-help and an indirect approach to behavioural design

Books focusing on habit formation and pop psychology are often featured in the self-help aisle of your local bookstore. These books are typically more accessible to the general public and are often “stickier” than the academic literature that they are based off of. While these books may be a step forward to make the ideas more accessible, many books that can be categorized as self-help may still be too dense and unapproachable for many readers to understand enough to apply correctly. While many books may provide prompts to nudge readers to put the theory into action, this is still largely dependant on the reader to follow the instructions that appear as ink on a page. In comparison, interactive self-help tools that guide a user through small actionable chunks of this content may be more effective for those wishing to improve their lives. Digital tools have the unique ability to provide nudges and triggers for action to shift people from a state of reading to doing (or preparation to action according to the transtheoretical model).

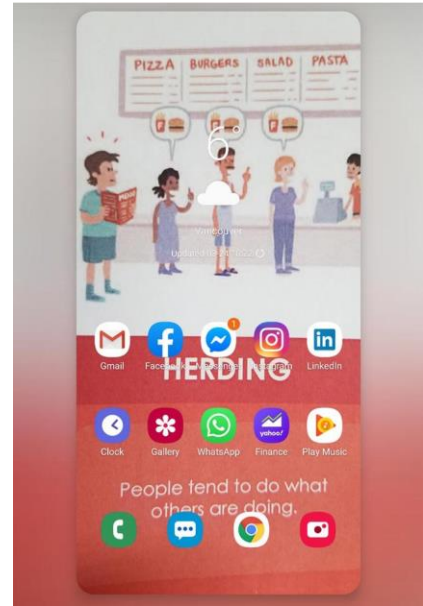
“Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime.” (Chinese proverb)

Self-help books often focus on transferring the wisdom or lessons learnt from an author, to a reader, to help individuals to change their perspectives’ and consequently their lives. These objectives are primarily educational whereas the definition of success for many digital interventions is focused on getting a user achieve a pre-defined behaviour. While both the self-help book and the digital intervention may have the goal of helping an individual to improve their wellbeing, the approach taken by the self-help book feels much more flexible and allows more agency for the reader to take the advice or not. This makes me wonder what a digital intervention, that affords the ability to provide triggers for action, that took this approach would look like? Instead of designing an app based on behavioural insights that can nudge someone into forming a habit through the traditional or direct approach to behaviour design (where the behaviour change happens as a direct result of a user interacting with the experience as described in Section 3), what if the app was able to teach users the tools/ techniques that they can

apply in their own lives to build habits independent of the digital tool in order to indirectly facilitate behaviour change using an **indirect approach to behavioural design**. For the designer creating this digital intervention, this then shifts the focus away from trying to induce behaviour change to teaching users how to use behavioural insights. If designed correctly, users who understand these instructions can then choose to apply the behavioural insights in ways that will modify their decision making through interactions in their environment that are independent from the digital intervention. In this way, the designer can still indirectly help the user to change their behaviours, but towards outcomes chosen by the user. This leads to my fourth design prototype which explores an application of the indirect approach to behavioural design.

Project 4 – The Cognitive Bias Trainer (CBT)

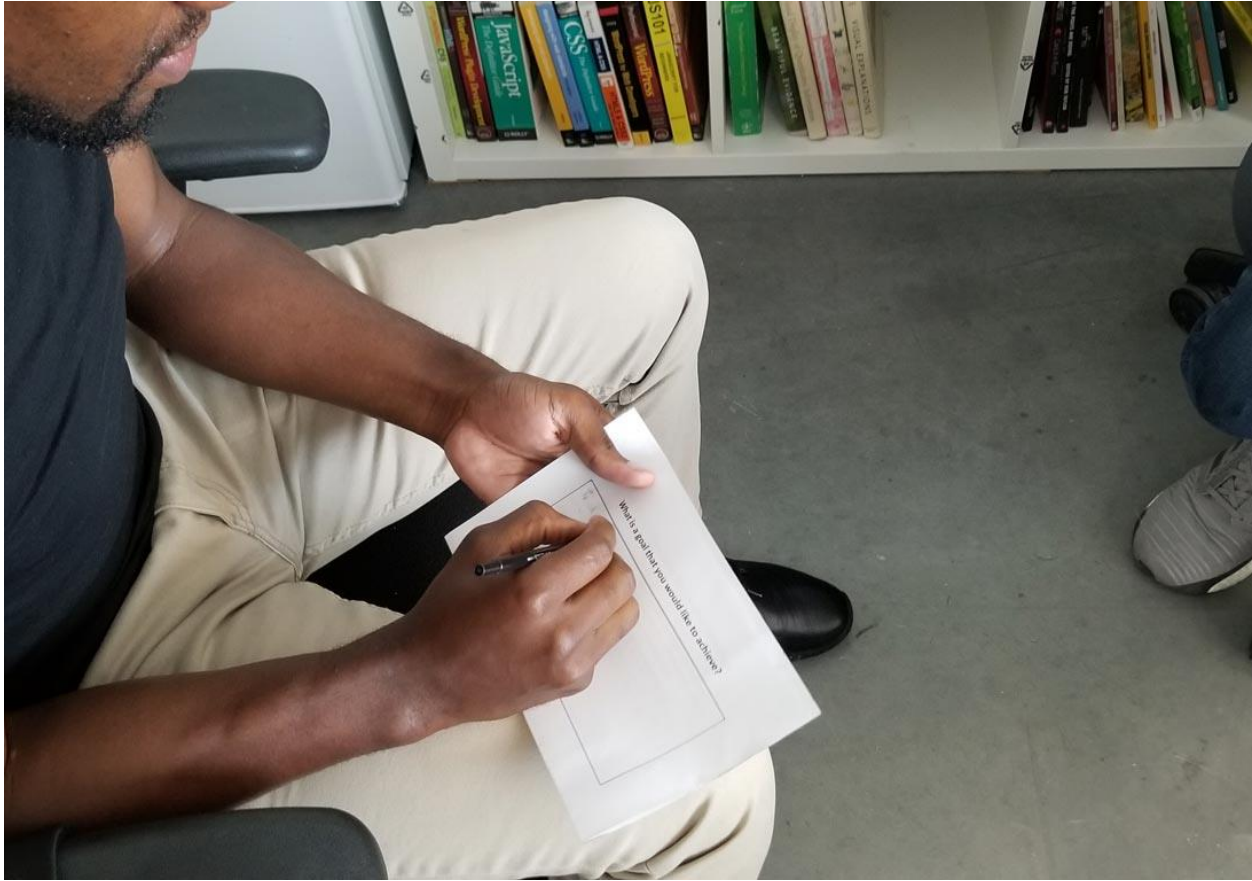
A discovery during my research was the [Designing for Behaviour Change Toolkit](#) from Bridgeable (a service design consultancy in Toronto). This toolkit included a deck of cards that featured different cognitive biases (Figure 30). Flipping through this deck and learning about these individual cognitive biases sparked the idea for a one-a-day experiment. Every morning before starting my day, I would take a photo of one of these cards and set it as my phone's background wallpaper. For the rest of the day, every time I opened and unlocked my phone, I would be greeted by this image and be compelled to remind myself what this cognitive bias was (Figure 31). Every night I would then write about my experiences with this cognitive bias in my notebook. The intention for this exercise and journaling practice was to find a way to be more cognizant about these cognitive biases, to notice where they were influencing my decision making during my day-to-day routine, and to find ways of preventing them from affecting my decisions in the future.



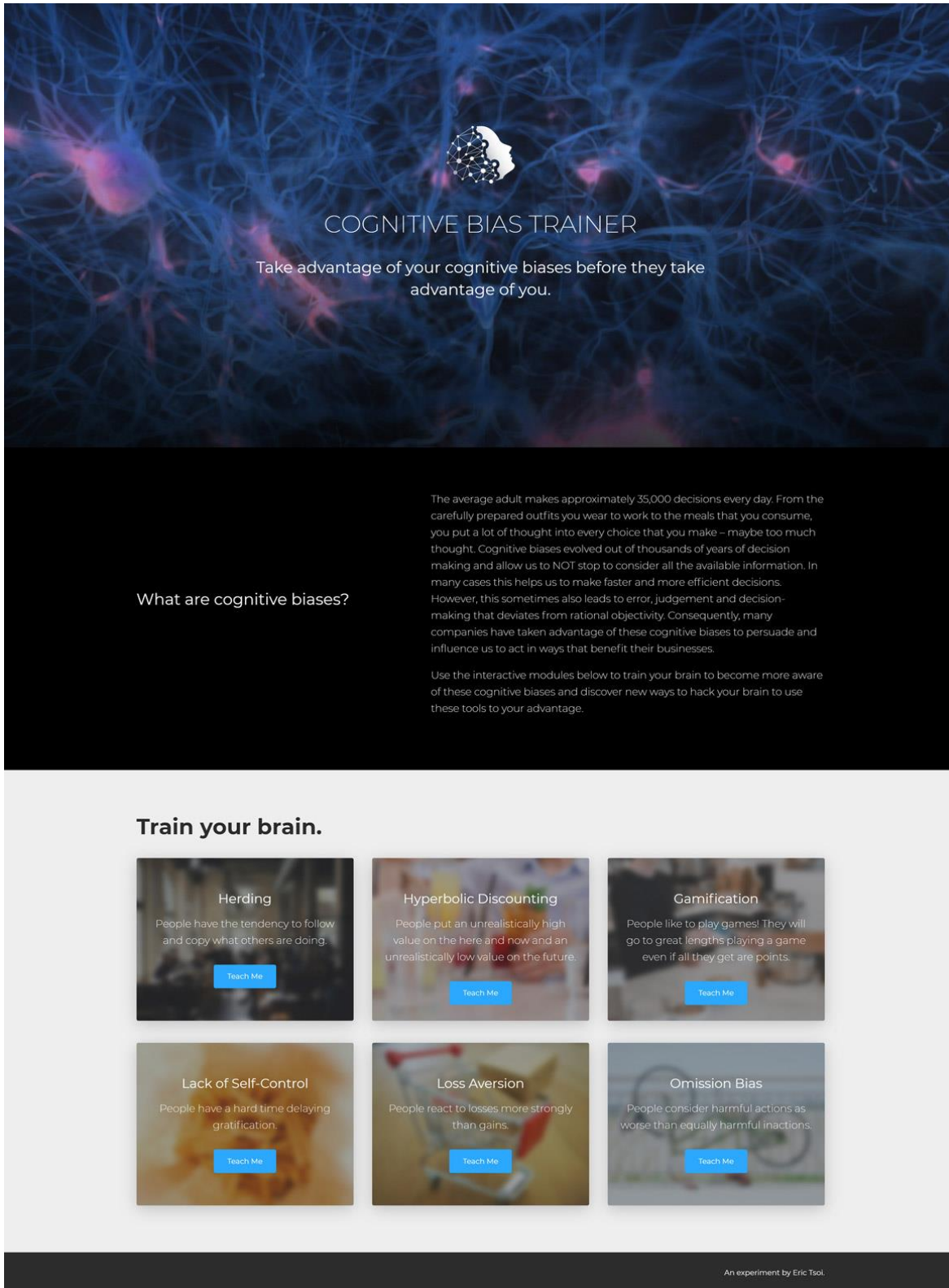
(Figure 30 (left) – An image of some cards from Bridgeable’s Designing for Behaviour Change Toolkit. The name of a cognitive bias is printed on the back of the card, and an illustration plus a one to two sentence explanation are printed on the front.

Figure 31 (right) – A photo of my phone with an image of a cognitive bias card set as the background wallpaper. Doing this forced me to think about this cognitive bias every time I opened my phone and helped me to become more aware of it throughout my day. In this example, being mindful of herding helped me to realize that many of my food cravings were being influenced based on what I saw my friends posting online via social media.)

These notes were then used to create a set of small paper-prototypes that attempted to replicate this experience for others to try (Figure 32). Small user testing sessions provided enough insights that then led to the design of a digital prototype that I called the “Cognitive Bias Trainer” (“CBT” from this point onwards). The CBT is an educational tool that can teach you how to “take advantage of your cognitive biases before they take advantage of you” (the tagline for this piece). The experience starts with a short description of what cognitive biases are (Figure 33), followed by a series of interactive models that each feature a different cognitive bias (Figure 34). User testing of this digital prototype and the iterations that followed helped to improve the usability of this tool in many ways. A “show more” button/ design pattern was implemented in the design of the module page to reduce decision fatigue and avoids the ethical problems associated with the “infinite scroll” alternative (Harris, 2016). Gameful elements such as reward screens and completion badges were later added to create a richer experience and motivate positive use.



(Figure 32 – A participant completing a task on a paper prototype during a user testing session in the early stages of the Cognitive Bias Trainer project. This prototype started by explaining a specific cognitive bias to the user (for example, loss aversion) then prompted them to answer a series of questions.)



(Figure 33 – A screenshot of the digital prototype created for the Cognitive Bias Trainer. This was the result of iterating on the paper prototype pictured in Figure 32 based on the insights provided during the user testing session.)

(Figure 34 – A video going through one of the lessons in the Cognitive Bias Trainer. Each lesson progress from (1) an explanation of what the bias is, accompanied with examples of where they might occur (highly informed by my one-a-day experiment and online research), to (2) examples of techniques to combat the examples provided in the previous step, to (3) prompts that ask users to reflect on a time when they may have been effected by this cognitive bias, to (4) a final exercise of imagining interventions that could help to prevent this bias from effecting their decision making in the future. This video can be found in the [online version of this document.](#))

One of the key insights that came from this project was the idea that “your excuses are cognitive biases in disguise”. I noticed during the reflective, one-a-day experiment that there were times when I would not want to do an activity that I had planned for myself (such as going to the gym or making my own dinner), and that I could use one or more cognitive bias to rationalize my faulty behaviour. This insight led to the hypothesis that, as a designer, if I can get people to become more aware of their cognitive biases, they would become more aware of their excuses, and as a result I could help them to build better, stronger and healthier habits. Instead of trying to help users become more aware of their cognitive biases, an iteration of this project that is more focused on habit formation might recommend that you strategically use these cognitive biases as a tool that you can use to trick yourself into changing your behaviours to build better habits. This tool could help those in the preparation, action and maintenance stages of the transtheoretical model. A tool like this may be useful if you have a habit or goal in mind and you need safeguards implemented in your environment to keep you on track to properly build the habit. In other words, this is a tool that gives you the tools to build stronger habits. Based on Kahneman’s (2011) notions of the experiencing self and the remembering self, this tool (and the CBT as a whole) would allow your strong and motivated self, the one who feels committed and wants to change in the moment, to set up environmental interventions based on behavioural insights that can nudge your future, weaker, less motived self to continue with the behaviours that lead to habit formation.

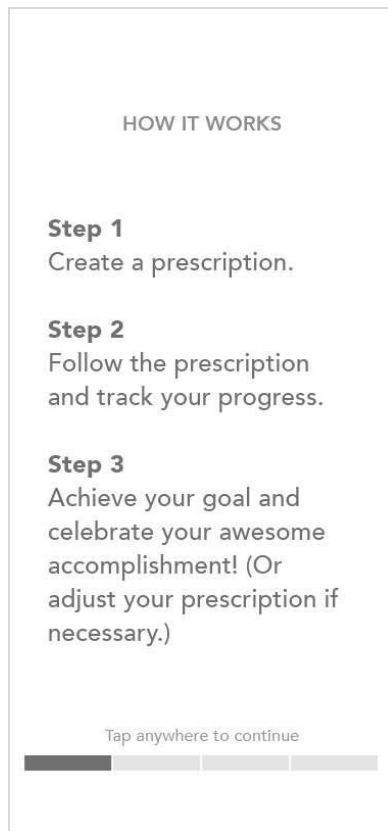
The problem that I see with the CBT is that it requires a certain amount of reflection and introspectiveness to be able to properly use. It requires that the user is mindful enough to be able to look back at their past experiences and can forecast their behaviours well enough in order to create effective interventions that can be used to help their future self. Another problem that I observed during user testing is that, depending how it is written, this content may be too dense and unapproachable for those unfamiliar with psychology and behavioural economics. Because the individual cognitive biases and their names are so abstract (for example, the “ostrich effect” or the “availability

heuristic”), it might be difficult to tap into them without the proper context or enough time to digest these ideas. Even for myself, someone who has been partially exposed to this space of behavioural insights, when trying to reflect on times when these biases have affected me or when brainstorming ideas for interventions, it took a lot of time and focused effort to comprehend some of these ideas well enough to be able to apply the knowledge in some way. Using Fogg’s Behaviour model as a lens, we can say that the CBT may require a high-level of ability in order to successfully achieve its functional purpose and may thus be unsuccessful even though triggers are present, and a user’s level of motivation may be sufficient for the proper behaviour to occur. Consequentially, it might be useful to explore alternative approaches of introducing these behavioural insights in future iterations of this work. Perhaps using common excuses or relatable behaviours as the navigational component (as opposed to the name of the cognitive bias) may make it easier for users to find, learn and apply these insights. A less text-heavy and a more visual or interactive approach may also be more effective to help potential users of this tool.

Project 5 – Habit Pill 2.0 (HP2.0)

Habit Pill 2.0 (HP2.0) is a rethink of Habit Pill 1.0 (HP1.0 – discussed in Section 3 above) that shifts my research focus from designing experiences based on behavioural insights that can directly cause behaviour change, to designing experiences that can teach users how to apply behavioural insights on themselves to indirectly cause behaviour change. The Cognitive Bias Trainer (CBT) represents my first attempt at designing for indirect behaviour change; HP2.0 is the result of iterating on HP1.0 based on this new direction and integrating parts of the CBT user experience into this new user flow. This project is guided by the question of: how can digital technologies be designed to teach people the behavioural tools and techniques (behavioural insights) that can be used to motivate personal behaviour change?

The first part of the HP2.0 user flow (that this case study will focus on) is the process of “writing a prescription” (Figure 35). This set of interactions helps a user to first “design a pill” in order to pick and define a goal that can improve their wellness, then second, “design an intervention” which involves translating behavioural insights into personalized interventions based on the obstacles that are most likely to prevent them from achieving their goal based on their own unique set and setting. An emphasis is



placed on educational aspects where users can learn more about the behavioural insights being used throughout this setup process, and how to best set their goals based on literature from the behavioural sciences. To test the validity of these ideas, an interactive low-fidelity prototype was created using Adobe XD which was then user tested with fellow designers.

(Figure 35 – An image carousel with the welcome screens of Habit Pill 2.0 that explain what a prescription is. This solution uses a conversational UI and heavily focuses on progressive disclosure and transparency of information so that users are aware of the methods being used to help them. Additional images from this carousel can be found in the [online version of this document.](#))

The process of “designing a pill” is an iteration of the onboarding flow from HP1.0 and is based on the idea of implementation intentions and goal setting (Clear, 2018). If a user doesn’t have a specific habit or goal identified when starting to use this tool, a user flow that was inspired by Myer’s (2000) Wheel of Wellness Counselling protocol (a model used to help individuals to develop personal wellness plans) is presented first to help them to determine an area of wellness to focus on (Figure 36).

(Figure 36 – A video demonstrating the process of “finding a habit” in Habit Pill 2.0. This primary step that was inspired by Myer’s Wheel of Wellness Counselling protocol is intended to help a user to identify the areas of their wellness that they are interested in improving, which area is best to focus on for this experience, and what habit can be adopted to improve this area; this habit is then used when the user creates their goal for their pill. In this example the user selects physical, environmental, social and occupational wellness as areas to improve. Based on the user’s responses, physical wellbeing is ranked and identified as the most important area of wellness that they can improve. This video can be found in the [online version of this document.](#))

DESIGN YOUR PILL

Hundreds of studies have shown that writing implementation intentions are effective for sticking to our goals!

Fill in the spaces below based on your goal to write your first implementation intention.

For the next ,
 I will for at
 least , .

Once a target behaviour/ habit has been identified, a series of interactions designed to instruct users on how to set realistic habit-forming goals is displayed. This part of the user flow guides a user through the process of writing an implementation intention (as described in Section 3, Figure 24) based on the habit that they want to achieve and completes the process of “designing a pill” (Figure 37).

(Figure 37 – An image carousel highlighting the process of writing an implementation intention in Habit Pill 2.0. The interactions in this part of the user flow were simplified from the first version of Habit Pill shown in Section 3, Figure 23. Additional images from this carousel can be found in the [online version of this document.](#))

Once a user has designed their pill, they need to “design an intervention”. In this context, interventions refer to behavioural or environmental modifications that can help to prevent common obstacles from getting between a user and their goal. The idea to have a user design an intervention was inspired by the insight that “your excuses are cognitive biases in disguise” and iterates on work done in the CBT project. In this step of the user flow (which is heavily based on the indirect approach to behavioural design), a set of interactions is designed to guide the user through a process of reflection, design and implementation of interventions based on the excuses that they feel would likely prevent them from achieving their goals (Figure 38). Each of the behavioural insights used in HP2.0 is supported by scientific literature that demonstrates their effectiveness in helping to change behaviour.

(Figure 38 – A video showing the process of “designing an intervention” in Habit Pill 2.0. In the app, common excuses that stop habits from forming are linked to cognitive biases and other behavioural insights, that if used as a tool and applied correctly, can minimize decreased goal-productivity. Interactive prompts are presented to guide a user through this content and help them to develop interventions based on these behavioural insights. In this example, the user has chosen “find a wellness buddy” as their intervention which is based on the behavioural insight of social accountability. This video can be found in the [online version of this document.](#))

When using the transtheoretical model (TTM, previously discussed in Section 2, Figure 16) as a lens to analyse this work, the onboarding and set-up of HP2.0 has the potential to bring users from a state of pre-contemplation to preparation (Figure 39). As the set of interactions that were discussed just covers the early stages of the user flow, there are many opportunities in later stages of the user experience to use this same approach of indirect behaviour change to facilitate progression through the action and maintenance stages of the TTM. Albeit, these two stages of the TTM may be the hardest to effectively facilitate in a habit-app without utilizing techniques that do not directly motivate behaviour change (for example, using streaks while tracking habits or using push notifications for reminders).



(Figure 39 – HP2.0 as it relates to the transtheoretical model. Users can use this tool whether or not they already know which area of wellness they would like to improve (thus, pre-contemplation to contemplation), and the interactions guide users through a series of behavioural insights that can help them to prime their behaviours or environment for action (thus, preparation).)

When designing to facilitate behaviour change using this indirect approach to behavioural design, a trade off lies in the amount of instructions and educational content necessary to effectively teach users the tools to change their behaviours. Further

opportunities exist in designing for users who do not have the motivation or ability necessary (to borrow the variables from Fogg's behaviour model) to properly integrate these behavioural insights into their daily lives based on these instructions.

Perhaps there is an ethical middle ground between designing experiences that directly cause behaviour change and those that teach tactics (behavioural insights) in order to indirectly cause behaviour change, that can still help people to change their behaviours. A solution like this could then facilitate all stages of the TTM and allow users to benefit from the effectiveness of a direct behaviour change tool while still having the transparency and agency associated with the more ethical indirect approach. A possible outcome could be an experience that follows this set-up and onboarding flow of HP2.0, then later also educates users on the optional built-in behavioural design features that can help them to maintain their behaviours and successfully build a habit. This ability to toggle on and off persuasive behavioural design features would allow for an opt-in experience and would allow complete agency for the end-user. Those who still want the direct assistance from persuasive technologies can benefit from these tools, and those who do not will still have the opportunity to learn the behavioural insights associated with them and can make use of them in their lives however they wish. Lastly, it is significant (and perhaps motivating) to know that these behavioural design features are still effective regardless of their methods being "exposed" to the end-user (Kahneman, 2011; Harris, 2016).

SECTION 6: SELF-IMPROVEMENT AS A PRACTICE

Continuing with the metaphor of magic as design, we can see how revealing the illusion and teaching individuals the secrets behind these behavioural design tricks can still create the same effect in the end. A critique of this indirect approach to behavioural design could be that it is “less fun” or seen as an approach that is “taking away the magic from the design” (when compared to the traditional/ direct approach), but I would argue that for some people they will experience just as much magic in the end. One of the things that stimulated and sustained my interest in close-up magic when I was younger was the feeling of amazement that I felt when learning how illusions worked and then being able to perform them myself. Understanding the psychology, seeing the secret moves and tools being used to create these effects was just as amazing as seeing the trick itself. More generally, it seems like being an insider and feeling like you are part of an exclusive club, learning, and then applying those insights for yourself can evoke similar feelings of astonishment. Like with magic, I experienced similar feelings when learning and understanding the behavioural insights involved in the design of persuasive technologies and testing the techniques on myself. The design intent is that Habit Pill, which uses this educational approach to teach users these secret (behavioural insight) techniques, can create the same experience of wonder and awe, so that more individuals can utilize these techniques to trick themselves into accomplishing their own self-defined wellness goals.

According to MacIntyre (1984), a practice is any “coherent and complex form of socially established and cooperative human activity through which goods internal to that form of activity are realized” (1984, p.186). He provides a wide range of examples from the practice of playing chess to the practice of architecture. Put another way, a practice is an activity based on the application of a set of skills, ideas or methods that when completed, results in a related reward (“goods” according to MacIntyre’s definition). These goods or rewards can either be internal (such as enjoyment, satisfaction and learnings) or external (such as money, power or fame) (MacIntyre, 1984, p.188). From this definition, perhaps we can say that just like how close-up magic is a practice, self-improvement through this self-reflective act of applying behavioural insights in ways that improve your wellness can also be a practice. The benefit of this perspective is in how it relates to habit formation. By learning, applying and slowly gaining mastery in a practice this creates enough intrinsic motivation to sustain engagement long enough for the practice to facilitate the behaviour change necessary to form a healthy habit (which on average takes 66 days (Lally et al., 2009)). So by teaching individuals the tools and techniques that they can apply in their own lives to build better habits, Habit Pill, and the

indirect approach to behavioural design that it uses, acts as a guide to a practice of self-improvement and can ultimately help to facilitate the habit formation process and the larger process of change in a much more sustainable way through the use of intrinsic motivational factors.

CONCLUSION

In this paper I have proposed an indirect approach to behavioural design which achieves behaviour change through indirect, non-persuasive mechanisms. This shift away from the traditional approach, where the behaviour change occurs as a direct result of an individual interacting with the system, has resulted in one that encourages users to use these techniques (behavioural insights) on themselves instead in order to allow human agency to flourish. As shown through the iterative design of Habit Pill, the indirect approach facilitates behaviour change through teaching users the tools and techniques that they can apply in their own lives to build healthy habits independent of the digital tool that was designed. In this way, the behaviour change happens as a result of an individual choosing to use and apply the insights that they have learnt and not as a direct result of them interacting with an experience and being manipulated to change.

Through an investigation that explored the use of behavioural insights in interactive technologies and the potential for these tools to facilitate personal behaviour change, many design activities were conducted, of which, five of them were shared. Investigation and reflection in this space has focused this research on the topic of designing experiences that can teach people the behavioural insights that are effective in helping to change behaviour, and how they can apply these behavioural tools and techniques in their own lives, in order to achieve progress towards a self-selected wellness goal. These interventions make it easier for users to learn and adopt these techniques, so that they can more effectively improve their own wellbeing without needing to review the literature or depend on technologies that manipulate them into changing their behaviour through persuasive tactics informed by their own behavioural data.

The first project that was shared was designed to spread the message that habits are medicine using tactics inspired by critical design and design activism. Exercitium Rx told the story of a miracle drug being discovered and laboratory tested, to it being advertised and sold, and speculated how it could be misused in the future. Work completed for Molecular You showed how an interactive dashboard could be designed to communicate complex medical data and suggest lifestyle recommendations in user friendly ways too support decision making by the end-user. Habit Pill, which continued the theme from Exercitium Rx, utilized the direct approach to behavioural design and imagined how behavioural insights could be used to help individuals to discover, build and share habits that fit their lifestyles and improves their health and wellbeing. Upon

exploring what ethical persuasive technologies might entail based on learnings from the practice of magic and the state of surveillance capitalism, the idea for an indirect approach to behavioural design emerged. The Cognitive Bias Trainer followed this indirect approach and was designed to help people to become more aware of their cognitive biases. This project led to the hypothesis that, as a designer, if I can get people to become more aware of their cognitive biases, they would become more aware of their excuses, and as a result I could help them to build better, stronger and healthier habits. A final design activity which tested this thesis and iterated on the original idea for Habit Pill prototyped how an interactive experience could teach people the behavioural tools and techniques that can be used to motivate personal behaviour change. This iteration of Habit Pill, which follows the indirect approach to behavioural design, acts as a guide to the practice of self-improvement and ultimately helps to facilitate the process of change in a much more sustainable and holistic way through prioritizing intrinsic motivational factors.

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