

Running head: REALITY-MACHINE: THOUGHT EXPERIMENT FOR PSYCHOTHERAPY

THE REALITY-MACHINE: DEVELOPMENT OF A THOUGHT EXPERIMENT MEASURE  
FOR POTENTIAL USE WITH PSYCHOTHERAPY CLIENTS

A DISSERTATION

SUBMITTED TO THE FACULTY

OF

THE GRADUATE SCHOOL OF APPLIED AND PROFESSIONAL PSYCHOLOGY

OF

RUTGERS,

THE STATE UNIVERSITY OF NEW JERSEY

BY

EVAN BENEDICT KALKUS

IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE

OF

DOCTOR OF PSYCHOLOGY

NEW BRUNSWICK, NEW JERSEY

MAY 2018

APPROVED:

\_\_\_\_\_  
Nancy Fagley, Ph.D.

\_\_\_\_\_  
Karen Riggs Skean, Psy.D.

DEAN:

\_\_\_\_\_  
Francine Conway, Ph.D.

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## REALITY-MACHINE: THOUGHT EXPERIMENT FOR PSYCHOTHERAPY

## Abstract

Philosophical thought experiments have been used throughout history to analyze decision-making and personality characteristics across many academic domains. Social psychologists have incorporated thought experiments in empirical research to better understand people's choices (Greene et al., 2001; Spranca et al., 1991, Uhlmann et al., 2009). However, thought experiments have not been formally studied in the context of their potential value as psychotherapeutic tools. This research discussed the advantages that thought experiments could have in psychotherapy, such as yielding a finite set of choices, and having diminished susceptibility to intentional impression management as compared to traditional assessment instruments. I examined participants' responses to a novel thought experiment, the Reality-Machine, which is a derivation and amalgamation of the Experience Machine (Nozick, 1974) and its reversal (De Brigard, 2010). Participants (N= 187) responded to the two scenarios outlined in the Reality-Machine, and four groups (Reality, Machine, Stay, Leave) were formed based on their responses. I hypothesized group differences on four decision-making and personality measures that have been shown to be related to psychotherapeutic outcomes: authenticity, experiential avoidance, resistance to change, and impulsivity. After controlling for the Big Five Factors and gender, significant differences in group means were found on the authenticity scale, indicating that the participants who were in either the Reality or Stay groups scored higher than those in the Leave group. The Leave group scored the lowest on the three authenticity subscales, and the highest on the aggregate measure of dysfunction, suggesting that those in the Leave group may have greater therapeutic needs. Additional themes were discussed based on the aggregate measure of dysfunction, subscales, and confidence measures for the scenarios. The results underscored the potential value of the Reality-Machine as a

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psychotherapeutic tool, demonstrating that thought experiments should be considered for use in psychotherapy. Research on the Reality-Machine in the context of actual therapy is warranted, as the study involved a non-therapeutic context, thus serving only as a benchmark for understanding some of the group differences. Potential future research, limitations, and additional uses in psychotherapy were discussed.

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## Acknowledgements

To Dr. Nancy Fagley, I extend my utmost appreciation. Your guidance throughout this process has been invaluable, and I felt at ease every step of the way knowing you were there to support me. I truly enjoyed working with you. To Dr. Karen Riggs Slean, thank you for your insight and suggestions. To both of you, thank you for believing in this idea, and taking the risk to help me with this project. At times, I doubted whether any of it made sense, but your constant encouragement and feedback were reassuring, and provided the momentum for this study. I was warned of the aches and pains of the dissertation process. In retrospect, those were either hyperboles, or you were the best committee I could have asked for. Given what I have heard from others who have slogged their way through a dissertation, I am leaning towards the latter.

To Dr. Kathy Stratton, thank you for two fantastic years of training and supervision, and in particular, the freedom to explore this thought experiment in a therapeutic context.

To Dr. John Styles, thank you for everything you have done for me. Gratitude for years of your wisdom is something I cannot overstate. Our class was the birthplace of the Reality-Machine, and without your trust, this dissertation would have no foundation.

To Dr. Karen Jimenez, thank you for being the extrinsic motivation I so desperately needed. When we first met, this was barely an idea, but you pushed me every step of the way. I sincerely could not have done this without your help.

To my family, thank you for putting up with me for over a quarter-century. That was no easy task. To Emily, thank you for everything.

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## Introduction

### Thought Experiments

Thought experiments have long been used across almost every academic domain, stemming from the Ancient Greek philosophers to 20<sup>th</sup> century biologists, physicists, and psychologists. The general concept of a thought experiment is to consider some theory, hypothetical in nature, in order to think through the potential outcomes and their relationship to the original proposition or value-based quandary. In a broad sense, they are recognized as potentially potent tools for increasing our understanding of nature and how people think (Kuhn, 1977).

Psychologists have often made use of thought experiments, primarily in the branch of social psychology, as a means to further understand human behavior and decision-making. A pair of thought experiments known as the ‘Trolley’ and ‘Footbridge’ dilemmas (Foot, 1967; Thompson, 1986) are frequently utilized by psychological researchers to understand how people distinguish between deontological and utilitarian. In such research, the thought experiments help to determine what participant characteristics shape their moral decision-making in such a way that cannot be replicated in actuality, due to obvious ethical constraints in replicating something like the ‘Trolley’ problem.

There exists a crucial distinction between the use of thought experiments in philosophy compared to their use in psychology. The former field utilizes them to explore the intricacies of philosophical theories and develop claims based on rational assumptions made about the conditions therein. The latter field makes use of thought experiments in the context of empirical study in which people’s responses to the “thought experiment” are analyzed, employing the scientific method to determine what conclusions are supported by data.

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In the field of psychotherapy, formal thought experiments have not been used to measure characteristics of clients. One relevant tool that has been documented is that of the analogy.

Analogies enable people to parallel their own experience, or that of another, with a tangible story that lends itself to distancing the subject matter of discussion from one's actual experience.

Analogies are accepted as therapeutic tools across many modalities of psychotherapy, including, but not limited to psychoanalysis, using dreams and archetypes as analogies (Freud, 1922; Jung, 1942), dialectical behavior therapy (Linehan, 2014), and cognitive behavioral therapy (Blenkiron, 2005; Weg, 2011). They can be used to help treat a variety of psychological ailments, and have a number of positive impacts on the well-being of a client, including, but not limited to, an improved therapeutic relationship, a wider range of evoked senses, a conjoining of rationality and emotions, stronger connections to abstract therapeutic processes, and improvement in overall mental health (Martin et al., 1990). While analogies help clients reach deeper levels of introspection and understanding, they do not directly address decision-making, a potentially key factor in determining how one reasons through difficult choices, as a thought experiment may do.

Another relevant tool is that of projective assessments. Projective assessments, such as the Rorschach test (Rorschach, 1921) and the Thematic Apperception Test (TAT) (Morgan & Murray, 1935), are personality tests that are designed to examine a person's response to ambiguous stimuli. These tests allow one to respond freely to a prompt, be it an ink-blot on the Rorschach, or a picture on the TAT, and their responses are subsequently analyzed based on themes and patterns within the respective test, as well as across trends found in others' cumulative responses to the tests. Systems have been developed to help score and interpret these tests, as well as provide as much empirical evidence for their reliability and validity as possible

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(Exner, 1974; Murray, 1943). These projective measures take advantage of a quality of open-endedness with regard to response, a liberty not allowed on many standardized objective measures, as well as many thought experiments. This creates some problems for comparative analysis in projective assessments, and highlights an important distinction when compared to thought experiments. The latter defines a finite set of choices for the participant. Rather than allowing one to respond to a dilemma or prompt with a creative, unbounded solution that could reveal an infinite and indefinable variety of subtle individual differences, thought experiments force a choice with defined parameters that would be able to be analyzed statistically, as well as clinically.

### **Decision-making**

Kanwal (2016) argues that decision-making as a factor influencing psychological dysfunction has not been properly explored. Though clinical diagnosis is heavily reliant on syndromic categorization, alternative approaches have been utilized that focus on basic processes that cut across the more traditional mental illness categories. Value-based decision-making has been targeted as a process category that is worth investigating further (Mukherjee, 2015). Value-based decision-making, in the context of psychotherapy, focuses on the values held by an individual and how they factor into the decisions made by said individual. There is empirical evidence for differences in value-based decision-making between individuals with schizophrenia (Sevy et al., 2007), obsessive compulsive disorder (Tolin et al., 2003), substance dependence (Bechara & Martin., 2004; Bickel & Marsch, 2001), and depression (Clark et al., 2011), when compared to healthy control individuals.

Three decision-making variables that are examined in this study are resistance to change, impulsive decision-making, and experiential avoidance. Resistance to change in psychotherapy is

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crucial to understand and address, as change is a primary function of psychotherapy. Because understanding client resistance to change is necessary to help clients engage in constructive change (Newman, 1994), being able to ascertain whether or not a client begins therapy with an inclination to resist change could greatly benefit the outcomes of therapy. Impulsive decision-making is often associated with psychopathology (Swann et al., 2002), and is linked to increased risk of substance abuse (Perry & Carroll, 2008) and risky behaviors, particularly in adolescents (Romer et al., 2009). Experiential avoidance is considered to be a pathological process recognized by a wide number of theoretical orientations, occurring when a person is unwilling to remain in contact with particular private experiences, such as thoughts or emotions, and takes steps to avoid, modify, or escape the essence of the experience (Hayes et al., 1996). Freudian analysis (1920), Rogerian therapy (1961), Gestalt therapy (Perls, 1951), existential therapy (Yalom, 1980), dialectical behavior therapy (Linehan, 1993), and acceptance and commitment therapy (Hayes, 1987) all treat experiential avoidance as either a primary factor leading to distress, a hindrance to the process of therapy, or a central theme worth tackling during therapy.

The selection of these three factors, while in part chosen because of their clinical relevance, was dependent on their potential relationship to the outcomes of a thought experiment that will be the focus of this study. The thought experiment, which will be referred to as the Reality-Machine, proposed in this study has its roots in philosophy. In Plato's *Republic*, the philosopher outlines a parable central to the field of epistemology known as the Allegory of the Cave. The allegory challenges the idea of real knowledge, whether experiencing something perceptually is a sufficient criterion for knowledge, which Plato argues it is not. In his book *Anarchy, State, and Utopia*, Robert Nozick twisted the ancient Grecian idea, and constructed a machine that could replicate the experience of reality for anyone who decided to plug into it

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(Nozick, 1974). It would mimic the experience of reality so well, that the user would believe they are in the real world, and are experiencing reality. Another benefit was that the user could pre-program their reality, and make it as wonderful as possible. Nozick presented this machine, the Experience Machine, as a means to counter hedonism. He believed that most people would prefer something inherently valuable, though potentially undefinable, in reality, and that no matter how pleasurable the reconstructed experience would be, it would be less desirable than real experience. De Brigard (2010) used a reversal of the Experience Machine thought experiment to show that Nozick's original assumption about one's unwillingness to enter the machine does not necessarily hold. By employing the use of a reversal, asking participants to opt out of the machine world rather than into it, De Brigard showed that over 80% of participants were unwilling to leave the machine if they knew their life in reality was significantly worse than their current life. Perhaps more unexpectedly, only half of the participants who were asked to make the same decision, but in the neutral and positive conditions in which their real lives were equivalent to or more wealthy than their machine lives, decided to leave the machine. De Brigard concluded that many people are affected by the status quo bias, a phenomenon characterized by a preference for the current state of affairs. It is a pervasive natural consequence of many psychologically-based deviations from rationality (Samuelson & Zeckhauser, 1988), ranging from regret avoidance (Kahneman & Tversky, 1982), drive for consistency (Akerlof & Dickens, 1982), or illusory control (Langer & Abelson, 1983). The Reality-Machine thought experiment conceived for this study attempts to account for the status quo bias and introduces the possibility of four distinct outcome groups with the hope of drawing distinguishable decision-making differences, as well as personality traits, between them.

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### **Personality**

One personality characteristic that will be featured in this study is authenticity. The construct of authenticity has been considered crucial in comprehending the human condition across many modalities of psychotherapy, including psychodynamic (Horney, 1951; Winnicott, 1965), developmental (Harter et al., 1996), existential (May, 1981; Yalom, 1980), person-centered (Joseph & Linley, 2005), and positive psychology (Sheldon, 1997). Based on a multilateral theory of authenticity (Rogers, 1961; Barrett-Lennard, 1998), three factors comprise the conceptualization: self-alienation, authentic living, and accepting external influence. Self-alienation involves the incongruity between conscious awareness and actual experience, as well as a feeling of being out of touch with one's true self. Authentic living involves the comparison of one's perception of conscious experience and behavior, as well as living in harmony one's beliefs and values. Accepting external influence involves allowing the beliefs and values of others to impact one's behaviors and beliefs.

Self-alienation is related to greater intensity of negative symptoms in patients with PTSD (Ehlers et al., 2000), and accepting external influence worsens the symptoms over time (Dunmore et al., 2001). Greater self-alienation was also found to be related to lower levels of hope in children (Harter et al., 1996). Those who avoid confrontation in close relationships by deprioritizing their needs and accepting external influence reported increased levels of depression, with the condition that their subordination of needs felt inauthentic to themselves (Neff & Harter, 2002). In regard to romantic relationships, authentic living and accepting external influence were found to correlate with greater self-esteem, lower depression, lower anxiety, and greater life satisfaction (Lopez & Rice, 2006). Strong correlations have also been



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found in a variety of contexts between authenticity, self-esteem, and well-being (Goldman & Kernis, 2002).

Additionally, research has shown that openness, conscientiousness, extraversion, agreeableness, and neuroticism, known as the Big Five Factors (Goldberg, 1993), are related to judgment and decision-making across a variety of contexts, particularly decisions to engage in risky health-related behaviors (Trobst et al., 2000). The personality factors are purported to affect decision-making by impacting confidence in decisions and heuristic biases (Trobst et al., 2000). Because of the evidence that personality, as operationalized by the Five Factor Theory of Personality, can be used to explain why people approach tasks and scenarios in different ways, it is important to consider them in the context of this study.

### **The Reality-Machine**

The Reality-Machine is a slightly modified combination of both Nozick's original thought experiment and De Brigard's reversal. Two scenarios are presented in conjunction, and the respondent is asked to decide what to do in each scenario after considering both.

#### *The Reality-Machine*

*Scenario 1: You are in reality. Everything around you is definitively real and actual. Your experiences are true in nature and are not illusions. Your family, friends, and possessions are real and exist. However, there is an experience machine that you may enter. If you choose to enter this machine, your life will improve. You cannot become immortal, but the experiences you value in life will be better than they were in reality. You will spend the rest of your life in the machine experiencing what will feel like reality to you. If you enter the machine, your experiences will not be real, but to you, they will seem to be. You will believe that what you are experiencing is reality, and this experience will be better than your current*

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*life. Your created life can be completely different, or a slightly improved version of your own. You may keep all of your friends and family members, or you can create new ones. If you enter the machine, you will not have an opportunity to leave, because you will not be aware that it is a machine. You could also stay in reality, but you will remember the opportunity you had to enter the machine.*

*Scenario 2: You are in an experience machine. Everything around you is a projection of reality. Your experiences are not actually happening and they are illusions. Your family, friends, and possessions are not real and do not exist. However, you are now aware of this and may leave the machine and enter reality. If you choose to leave this machine, your life will worsen. You will spend the rest of your life in reality experiencing the actual world. You will not only believe what you are experiencing is real, but you will know it is so, though it will be worse than your life in the machine. Your life outside the machine may be similar or distinct from your life inside the machine. You could also choose to stay in the machine, and in doing so, you would forget that you are in a machine and believe that your life is real and actual. You will not receive another opportunity to leave the machine.*

*The difference in experience should be the same in each scenario. If going to the machine in Scenario 1 gets you a better phone, leaving the machine in Scenario 2 would have you getting a worse phone than the one you have.*

*Having read through each scenario, what would you choose to do?*

*In Scenario 1, do you stay in reality, or leave and enter the machine?*      [STAY] [LEAVE]

*In Scenario 2, do you stay in the machine, or leave and enter reality?*      [STAY] [LEAVE]

*Please give a brief explanation of your decisions:*

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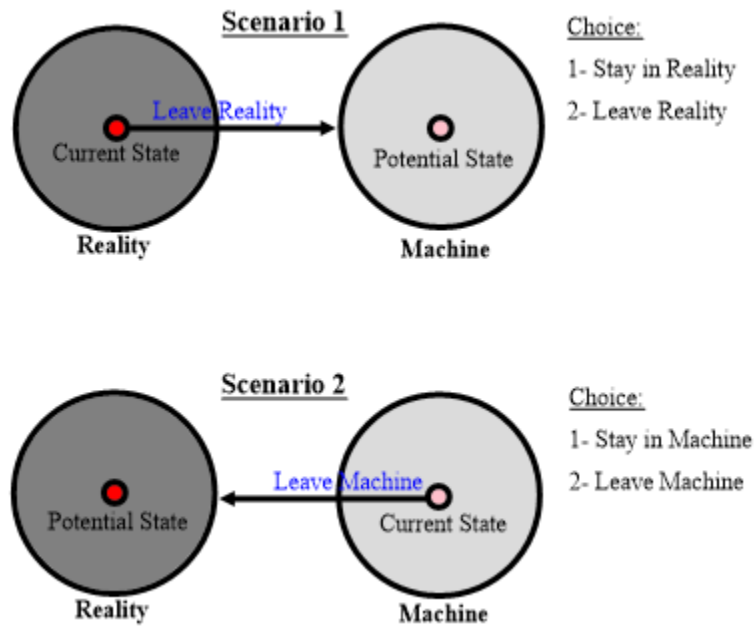


Figure 1. Diagram of Reality-Machine Scenarios.

The advantage of combining the two scenarios is twofold. The first is that both scenarios involve a status quo option, which can result in one advocating for the status quo twice. This emphasizes their valuing of the status quo while simultaneously devaluing the importance of reality. The second is that it results in four groups, which allows for a more complex understanding of each response. The nature of the groups is the primary goal to be explored in this study, notably whether or not these groups are inherently distinct from each other with regard to the aforementioned decision-making measures. The four groups will be referred to as Reality, Machine, Stay, and Leave.

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Table 1

*The four groups relative to both scenarios*

		<u><b>Scenario 1</b></u>	
		<u><b>Choices</b></u>	
		<b>Stay</b>	<b>Leave</b>
<u><b>Scenario 2</b></u>	<b>Leave</b>	<i>Reality</i>	<i>Leave</i>
<u><b>Choices</b></u>	<b>Stay</b>	<i>Stay</i>	<i>Machine</i>

The following qualitative synopses are based on a variety of sources, primarily classroom exercises over five years and 200 students, as well as approximately 20 college undergraduate and graduate students who participated in ongoing counseling. A wide array of possible explanations for their decisions were offered, and while it is important to note that particular group membership for one might be the result of very different reasons or values than another of the same group. The preferences, rationale, and dynamics described in this section are based on the majority of responses that have led to identifiable themes in the groups.

The Reality group consists of those who decided to stay in reality in Scenario 1, and leave the machine in Scenario 2. This group consists of those who choose reality over the machine. They adhere to Nozick's assumptions about a preference for true experience, and not the illusion of experience. They value truth over pleasure, and are willing to sacrifice their current life, if it is simply an illusion, despite how satisfied they are with it. There is something important about realness and sincerity that seems to trump other qualities. The most common explanation of this decision expressed by my students is a reference to intuition, that it simply feels like the right thing to do, as living a life that is not real cannot truly be fulfilling. Clients who fall into this group are not only willing to explore themselves, but are eager to find truth and

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understanding of their beliefs and actions. They tend to want answers, no matter how unpleasant, or even more jarring, nonexistent, those answers may be. Under the assumption that good therapy is deep, penetrating, and truth-seeking at its core (Yalom, 1989), this group has the potential to yield the most positive therapeutic outcomes. The personality variable proposed to be the most consistent with this group is authenticity.

The Machine group consists of those who decided to leave reality in Scenario 1, and stay in the machine in Scenario 2. This group consists of those who choose the machine over reality. They appeal to a hedonistic style of thinking. Pleasure is the goal, and its optimization is sought. The value of pleasure trumps the possibility of it simply being a deceptive illusion. They potentially embrace skepticism about reality as a concept, and often suggest that reality is just an experience of external stimuli, not so different from the machine, so they might as well increase the gain from the experience. There may be an embracing of blissful ignorance that leads to this decision. A willingness to let others deceive, and to even deceive oneself, could be seen in those in this group. Clients who fall into this group can be challenging to work with, particularly if they hold an appreciation for blissful ignorance. Those in the Machine group decide to avoid the unpleasant truth of reality, and instead embrace the mirage of the machine. In choosing to not confront the potentially harsh nature of reality, they embrace the distorted experience, and though the illusion may offer comfort and bliss, it acts as an emotional crutch that invariably weakens a person (Yalom, 1989). The decision-making variable proposed to be the most consistent with this group is experiential avoidance.

The Stay group consists of those who decided to stay in reality in Scenario 1, and stay in the machine in Scenario 2. This group consists of those who choose to stay in their relative conditions for both scenarios. They are those most strongly affected by the status quo bias, as

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their goal is to maintain the current state, valuing consistency over truth or pleasure. One of the most common positive themes is a satisfaction with life. This group tends to be risk averse, afraid of change, and reluctant to try new things. They thrive in comfort zones and do not tend to stray outside of them. There is a fear of the unknown and a marked appreciation for consistency, and they may have a tendency to shy away from challenges. Change is a crucial component to therapy, and those in this group are potentially the most resistant to change. It does not matter if the alternative is more or less pleasurable, or if the alternative is more or less real, it simply matters that they remain the same. The decision-making variable proposed to be the most consistent with this group is resistance to change.

The Leave group consists of those who decided to leave reality in Scenario 1, and leave the machine in Scenario 2. This group consists of those who choose to leave their relative conditions for both scenarios. They are those who are, to some degree, dissatisfied with their current state. The goal is to abandon their situation and seek something different. Often, responses are consistent with a novelty seeking personality, a feature of which is impulsive decision-making. There is a desire for something new, unknown, and potentially challenging. However, this choice can be indicative of a depressive escapist mentality. The dissatisfaction with the status quo is so prevalent that one is willing to abandon their current life, either for reality or fantasy, in order to avoid their current situation. While there is potential for those in this group to present as adventurous and desiring new experiences, a worrisome and plausible theme is a yearning for something that is not their current situation precisely because they are dissatisfied. Because of the relationship between impulsivity and dissatisfaction, those in this group may present with an elevated level of risk. The decision-making variable proposed to be the most consistent with this group is impulsive decision-making.

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The relevance of the four groups stems from their potential to highlight the aforementioned decision-making and personality factors that are related to the therapeutic process. While a procrustean approach should be avoided, it is suggested that the group membership will predict the decision-making variables in such a way that would allow therapists to work with clients who advocate for each group with a perspective that would lend itself to the facilitation of helpful and insightful therapy. Perhaps more valuable than the potential to clue a therapist into the decision-making style of a client, the grouping allows for a metacognitive process to take place between therapist and client, during which the decisions made in the Reality-Machine can be explored in parallel or context to decisions made throughout the client's life, or in the context of their presenting problem. This dialogue could serve as an important factor in therapy, either as a means to structure the future of the therapy, or to add a layer of depth to the discussion and understanding of the client.

The Reality-Machine may also aid in the minimizing of response bias often found with self-reports. By employing the use of abstraction, it makes the meaning of a client's response less obvious than a self-report rating scale would, potentially disguising the intent of the thought experiment. It also yields the potential for inconsistency between the client's ideal self and real self. Perhaps the decisions for which they advocate in the Reality-Machine are inconsistent with their real life choices. For example, a client in the Reality group does not want to know whether or not their significant other is unfaithful, and would rather live under the illusion that they are faithful. Conceivably, a client in the Machine group could prefer openness and transparency in their relationship with their parents, yearning for honesty as opposed to discretion, secrecy, and the mirage of sincerity. Perhaps a client in the Stay group constantly abandons new projects or partnerships. Maybe a client in the Leave group is terrified of losing loved ones and presents

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with a rigid demeanor that often freezes them in process of changing their life. These inconsistencies will not be able to be observed in the context of this study, but nevertheless should be considered a valuable use of the Reality-Machine.

The current study is interested in examining elements of analogical reasoning in therapy with decision-making and personality factors that are pertinent to the therapeutic process. Given a lack of research using thought experiments in the context of therapy, and that the Reality-Machine is a new construct and new measure, this pilot study will primarily examine whether or not there are distinctions between the aforementioned decision-making and personality measures across the thought experiment groups. If there were to be significant differences, given the relevance of those factors in therapy, the assumption would be that the Reality-Machine can be used as a therapeutic tool to not only aid the facilitation of therapy, but enhance the depth of discussion and self-understanding for a client.

### **Hypotheses and Predictions**

Participants were asked to respond to the two scenarios, provide a brief explanation, and then complete a series of measures assessing the decision-making and personality variables. On the authenticity scale (Wood et al., 2008), the items are split into three subscales: authentic living, self-alienation, and accepting external influence. Higher scores on the authentic living subscale are indicative of a tendency to live consistently with one's beliefs, higher scores on the self-alienation and accepting external influence subscale are indicative of a tendency to feel disconnected with oneself and to feel compelled to cater to the wants of others, respectively. On the experiential avoidance questionnaire (Gamez et al., 2011), the items are split into five subscales: behavioral avoidance, distress aversion, procrastination, distraction and suppression, repression and denial, and distress endurance. Higher scores are indicative of a tendency to avoid



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experience, save for the latter subscale, for which higher scores indicate a resilience to distress that will be inversely factored into the total score. On the resistance to change scale (Oreg, 2003), the items are split into four subscales: routine seeking, emotional reaction, short-term focus, and cognitive rigidity. Higher scores are indicative of a strong resistance to change. On the impulsivity inventory (Dickman, 1990), the items are split into two subscales: functional impulsivity and dysfunctional impulsivity. Higher scores are indicative of either a tendency to act impulsively when doing so is optimal (functional) or a tendency to act impulsively when doing so causes problems (dysfunctional). A personality inventory (John et al., 1991) was also utilized as a control measure to determine the influence of personality differences on the relationship between the thought experiment groups and decision-making measures. The Big Five Inventory is divided into five dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Higher scores are indicative of higher levels of each personality trait.

- I. Reality will be the largest group.
- II. Leave will be the smallest group.
- III. Gender will not be related to Reality-Machine group membership.
- IV. Reality group will have the highest total score on the Authenticity Scale.
- V. Machine group will have the highest total score on the Multidimensional Experiential Avoidance Questionnaire.
- VI. Stay group will have the highest total score on the Resistance to Change scale.
- VII. Leave group will have the highest total score on the Dickman Impulsivity Inventory functional impulsivity subscale.

## REALITY-MACHINE: THOUGHT EXPERIMENT FOR PSYCHOTHERAPY

### Methodology

#### Participants

A sample size of 216 participants would provide adequate power (70%) to detect a medium effect ( $f=0.25$ ) when conducting a multivariate analysis of variance (MANOVA) (Stevens, 1996). The study administrator created a survey combining the thought experiment decision scenarios, the three decision-making questionnaires, and the two personality questionnaires, all through the Qualtrics survey software licensed by Rutgers. The study was posted on the Psychology Department's subject pool website, which uses Sona System software. Undergraduate psychology students were able to read a brief description of the study, and if interested to know more, could go to the informed consent page. If they agreed, they completed the survey and receive credit for participating anonymously that fulfilled a portion of their human research requirements. The Sona Systems software makes it possible for students' anonymity to be maintained while recording their participation. The researcher never knows the students' names.

#### Materials and Measures

**Reality-Machine.** The Reality-Machine is an experimenter-developed thought experiment based on Nozick's (1974) idea of the Experience machine that was presented as shown above, in conjunction with a pair of diagrams to help the participants visualize the scenarios. The first diagram depicts the potential actions of the first scenario, whether staying in reality or leaving to enter the machine, and the second diagram depicts the potential actions of the second scenario, whether staying in the machine or leaving to enter reality. It was accompanied by a text-block in which participants could offer a qualitative response for their decision. The suggested time for this portion of the study was five minutes. The measure was

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scored using a quaternary system, in which each group (Reality, Machine, Stay, Leave) was coded with a number (1, 2, 3, 4) in order to perform the appropriate statistical analyses.

**Authenticity Scale.** The Authenticity Scale is a 12-item measure that is designed to assess a person's tendency to live authentically, self-alienate, and accept influence from others (Wood et al., 2008). For example, one item from the Authentic Living subscale was "I am true to myself in most situations." Participants were asked to respond to the items on a 7-point Likert scale, with responses ranging from 'Does not describe me at all' to 'Describes me very well'.

The Authenticity Scale's three subscales, Authentic Living, Accepting External Influence, and Self-Alienation, are each comprised of 4 items. The Authentic Living subscale is positively related to psychological well-being, whereas the Accepting External Influence and Self-Alienation subscales are negatively related to psychological well-being. Because of this discrepancy, items on the Accepting External Influence and Self-Alienation subscales were reverse scored, so that a total score can be determined for the Authenticity Scale. Thus, a score of 1 on an item on either the Accepting External Influence or Self-Alienation subscales was changed to a 7 so the subscale scores can be summed in order to reflect the combination of authenticity across the three domains. Therefore, a high score on overall authenticity indicates a person's tendency to live authentically, to avoid self-alienation, and to avoid influence from others.

The Authenticity Scale subscales demonstrate good internal consistency, with alpha coefficients ranging from 0.70 to 0.86. Additionally, the subscales demonstrate strong test-retest reliability, with correlations between 0.78 and 0.91 after a 4-week period, with both intervals showing group-level stability. With regard to discriminant validity, social desirability showed very low and nonsignificant correlations with the Authenticity scale. With regard to the Big Five

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Factors, authenticity as a construct appears to be positively correlated with extraversion, agreeableness, conscientiousness, and openness, while negatively correlated with neuroticism, but the results of a multiple regression reveal that authenticity cannot be reduced to a linear combination of traits from the Big Five, as the latter only accounts for a small percentage of the variance in the subscales of the Authenticity Scale (11%-13%). This demonstrates that the Authenticity Scale is not simply a reconfiguration of Big Five traits. Wood et al. (2008) reported a nonsignificant correlation between the Authenticity Scale subscales and the HEXACO measure for a sixth factor of personality, a combination of humility and honesty. The Authenticity scale also demonstrated significant correlations with measures of self-esteem, happiness, life satisfaction, anxiety, stress, positive affect, and negative affect, showing that authenticity is related to self-esteem, subjective well-being, and psychological well-being (Wood et al., 2008).

**Multidimensional Experiential Avoidance Questionnaire.** The Multidimensional Experiential Avoidance Questionnaire (MEAQ) is a 62-item measure that is designed to assess a person's tendency to avoid negative internal experiences (Gámez et al., 2011). For example, on the Distraction and Suppression subscale, "When something upsetting comes up, I try very hard to stop thinking about it." Participants were asked to respond to the items on a 6-point Likert scale, with responses ranging from 'Strongly disagree' to 'Strongly agree'.

The MEAQ's six subscales, Behavioral Avoidance, Distress Aversion, Procrastination, Distraction and Suppression, Repression and Denial, and Distress Endurance are comprised of 11, 13, 7, 7, 13, 11 items, respectively. Item 30 (Procrastination) and item 23 (Repression and Denial) are reverse scored. The first five subscales were summed, and added to the Distress Endurance subscale score subtracted from 77. The reason for this is that higher scores for the first five subscales indicate a strong tendency to avoid experiences, but higher scores for the last

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subscale indicate a strong tendency to engage with experiences. A reversed score was created, such that the higher an individual scores on the Reversed Distress Endurance subscale, the less they can endure distress, which should be representative of their overall tendency to avoid experience.

The MEAQ subscales demonstrate good internal consistency, with alpha coefficients averaging 0.83 (range of 0.80-0.87). It also correlates highly with a number of other measures, with associations between the MEAQ subscales and other measures of avoidance suggesting that the MEAQ subscales cover a wide range of avoidance content, with the largest associations occurring with the Acceptance and Action Questionnaire (AAQ) and AAQ-2. While the MEAQ shows convergence with similar measures, the MEAQ subscales also provide new information beyond existing measures of avoidance. The MEAQ provides more incremental power in explaining avoidance content (mean partial  $r = 0.31$  than other measures such as the AAQ-2 (mean partial  $r = 0.19$ ) (Gámez et al., 2011).

**Resistance to Change.** The Resistance to Change scale (RTC) is a 17-item measure that is designed to assess an individual's dispositional inclination to resist change (Oreg, 2003). For example, on the Routine Seeking subscale, “I’ll take a routine day over a day full of unexpected events at any time.” Participants were asked to respond to the items on a 6-point Likert scale, with responses ranging from ‘Strongly disagree’ to ‘Strongly agree’.

The RTC’s four subscales, Routine seeking, Emotional reaction, Short-term focus, and Cognitive rigidity are comprised of 5, 4, 4, and 4 items, respectively. Item 4 (Routing seeking) and Item 14 (Cognitive rigidity) were reversed scored. The four subscales were summed to determine an individual’s total score, with the average of the four subscales representing their overall RTC score.

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The RTC demonstrates good internal consistency, with the overall alpha coefficient being 0.92. Additionally, construct validity of the resistance to change scores was demonstrated. Resistance to change was associated with traits such as sensation seeking, tolerance for ambiguity, and risk aversion, and relationships were also found with openness to experience, dogmatism, neuroticism, and extraversion. However, the fact that correlations were only moderate and were substantially lower than the scales' reliabilities yielded support for the construct's discriminant validity (Oreg, 2003).

**Dickman Impulsivity Inventory.** The Dickman Impulsivity Inventory (DII) is a 23-item measure that is designed to assess the personality trait of impulsivity (Dickman, 1990). For example, on the Functional Impulsivity subscale, "I have often missed out on opportunities because I couldn't make up my mind fast enough." Participants were asked to respond to indicate whether the statements were True or False.

The DII's two subscales, Functional Impulsivity and Dysfunctional Impulsivity, are comprised of 11 and 12 items, respectively. Only the Functional Impulsivity subscale was utilized in this study. The scale was coded using a binary system, in which True is scored with 1, and False is scored with 0. Items 1, 4, 6, 9, and 11 (Functional Impulsivity) were reversed scored.

The Functional subscale demonstrated acceptable internal consistency with an alpha coefficient of 0.74. The Functional Impulsivity subscale correlated significantly with other impulsivity scales, including the Eysenck Personality Inventory (EPI) and the Barratt Impulsivity Scale (BIS-5), with all of the correlations in the table being statistically significant ( $p < 0.05$ ) (Dickman, 1990).

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**The Big Five Inventory.** The Big Five Inventory (BFI) is a 44-item measure that is designed to assess the personality traits specified by the Five Factor Theory of Personality, namely Openness, characterized by originality, curiosity, and ingenuity, Conscientiousness, characterized by orderliness, responsibility, and dependability, Extraversion, characterized by talkativeness, assertiveness, and energy, Agreeableness, characterized by good-naturedness, cooperativeness, and trust, and Neuroticism, characterized by how easily upset one may get (Digman, 1990; John et al., 1991). Participants were asked to respond to the items on a 5-point Likert scale, with responses ranging from ‘Disagree strongly’ to ‘Agree strongly’.

The BFI’s five subscales, Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism, are comprised of 10, 9, 8, 9, and 8 items, respectively. Items 35 and 41 (Openness), 8, 18, 23, and 43 (Conscientiousness), 6, 21, and 31 (Extraversion), 2, 12, 27, and 37 (Agreeableness), and 9, 24, and 24 (Neuroticism) were reversed scored. Each subscale was then averaged separately to determine each subscale score.

The BFI demonstrates good internal consistency, with the average overall alpha coefficient being over 0.80, typically ranging from 0.75 to 0.90. Three-month test-retest reliabilities range from 0.80 to 0.90, with a mean of 0.85. Evidence of validity includes substantial convergent and divergent relationships with alternative Big Five instruments, as well as with peer ratings (John et al., 1990).

**Overall Dysfunction (ZTOTAL).** One additional scale was constructed: Overall Dysfunction. To construct this measure, the total scores of the authenticity, experiential avoidance, resistance to change, and functional impulsivity were converted to z-scores, and combined ( $ZEA\_TOT + ZRTC\_TOT + ZDII\_TOT - ZAUTH\_TOT$ ) to form ZTOTAL, a proposed aggregate measure of dysfunction.

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### Design and Procedure

A pilot study was conducted in a class of approximately 40 Rutgers University undergraduates. It was offered as an extra-credit opportunity for students, in conjunction with an equally weighted, both in terms of time and credit, alternative for those that did not wish to participate. Students that did participate were given the opportunity to give or deny permission for their responses to be included anonymously in the pilot study. The preliminary study allowed the experimenter to ensure that the procedures were clear to respondents, the Reality-Machine measure was understandable, and that the response process for that component would take at most 10 minutes. The pilot study was conducted in-person despite the survey being conducted online. It was proposed that if the pilot study revealed that all elements of the experiment were functional, the primary data collection stage of the experiment could begin. If the pilot study revealed that particular areas of the design were dysfunctional, changes would have been made to address said issues, and a second series of testing would be conducted to determine if the primary data collection could begin.

Prior to data collection, the experimenter created a diagram for the Reality-Machine thought experiment. This was included in conjunction with the Reality-Machine description, scenarios, and choices. The experimenter constructed an online survey, which was administered via the Qualtrics Survey software, consisting of the Reality-Machine measure, the three decision-making measures, and the personality measure.

Each measure was prefaced with the appropriate instructions that enabled the participants to take the survey without any external instructions or support. The informed consent page assured participants that their participation was anonymous and they would not be required to submit any protected health information (PHI). They were also informed that they would receive



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research participation credit upon completion of the survey. Participants were reminded, on both the informed consent page and on the debriefing page, to not speak about the study with others, as to not influence potential future participants' decisions.

### Data Analysis

- I. Hypotheses I and II were tested by conducting a chi-square goodness of fit test to determine whether the distribution Reality-Machine groups are uneven, specifically that the Reality, Machine, and Stay groups are each significantly larger than the Leave group.
- II. Hypothesis III was tested by conducting a Chi-square independence test to determine if gender is related to Reality-Machine group membership.
- III. A bivariate correlation analyses were conducted to determine the relationship between the Big Five Factors and the other scales. If significant, Hypotheses IV, V, VI, and VII were to be tested by conducting a one-way MANCOVA, with Group as the independent variable, and the Big Five Factors as covariates, to determine if there are group differences with regard to the dependent variables, which are the authenticity scale and the three decision-making scales.
- IV. A MANOVA was conducted to determine if there were differences on the four scales with regard to gender, and if there were significant differences, gender would be included as a covariate in the aforementioned MANCOVA.
- V. A MANCOVA was conducted to determine if there were overall differences on the measure of confidence in one's decision for the two scenarios, based on Reality-Machine group membership.
- VI. An ANCOVA was conducted to determine if there were group differences on the aggregate dysfunction measure, ZTOTAL.

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### Results

#### Pilot Study

The pilot study responses ( $n = 40$ ) consisted of ratings by the participants on how well they understood the scenarios, ranging from 1 (Very difficult to understand) to 6 (Very easy to understand). The mean for understandability was 5.275, with a median of 6, mode of 6, and only one participant rated their understanding of the scenarios as a 3. No participants rated their understanding of either scenario as 1 or 2. Subsequently, no changes were made to the scenario descriptions.

#### Data Cleaning

Before proceeding with the data analysis, all cases ( $N = 216$ ) were screened for incomplete surveys, duplicates (as participants occasionally came to the survey more than once), denied use disclaimer (as participants could opt to withdraw after completing the survey), excessively quick completion time, age below the age of consent, missing values, and outliers. Additionally, all reversed items were scored appropriately, and reliability was assessed for each subscale.

Surveys were incomplete for 19 cases and consequently they were not labeled as finishers, an additional 7 cases completed the survey twice, having been submitted by the same SONA identification number, and an additional 3 cases had asked to withdraw after completing the survey ( $N = 187$ ). All included subjects were 18 years of age or older. I completed two time trials to provide an estimate of how fast should be considered too fast to constitute a valid completion time. The first was to complete the survey as fast as possible (~110 seconds), and the second was to complete the survey as fast as possible while reading each item (~240 seconds).

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Only one case was recorded below 240 seconds (239 seconds), but was deemed not substantially lower such that it should be excluded.

The following items were reverse scored appropriately for each subscale. Authenticity (AUTH): 2, 3, 4, 5, 6, 7, 10, 12. Experiential Avoidance (EA): 23, 30. Resistance to Change (RTC): 4, 14. Functional Impulsivity (DII): 1,4,6,9,11. Big Five Factors (BFI): 2, 6, 8, 9, 12, 18, 21, 23, 24, 27, 31, 34, 35, 37, 41, 43.

Subscale scores were converted to z-scores, and were subsequently searched for z-score values  $> 3.29$  or  $< -3.29$  (Tabachnick & Fidell, 2007). Two cases were identified as univariate outliers on the AUTH\_AL subscale, with identical subscale scores and z-scores (subscale score = 4, z-score = -3.77). These two cases, though low relative to the other AUTH\_AL subscale scores, were not deemed to be unusually low relative to the other authenticity subscale scores within each case, and thus were not excluded from the analysis.

Mahalanobis distances (MD) were computed for each continuous variable, including all subscales and total scale scores ( $n = 19$ ). Two cases were identified as multivariate outliers, based on MD and cumulative MD probability (MDprob) ( $MD1 = 51.25464$ ,  $MDprob1 = .00009$ ;  $MD2 = 50.42209$ ,  $MDprob = .00011$ ), both MDprob falling below the  $p = .001$  threshold (Tabachnick & Fidell, 2007). These two cases, though unusual relative to other cases, were not illogical and were paired with coherent rationale with regard to the decisions made in the scenarios, and thus were not excluded from the analysis. Each subscale and scale total was assessed for reliability (see Table 1).

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Table 2

*Scale and subscale reliability*

<b><u>Measure</u></b>	<b><u>Scale</u></b>	<b><u>Cronbach's Alpha</u></b>
<i><b>Authenticity</b></i>	Authentic Living	.804
	Acceptance of External Influence	.878
	Self-alienation	.870
	<b>AUTH_TOTAL</b>	.878
<i><b>Experiential Avoidance</b></i>	Behavioral Avoidance	.888
	Distress Aversion	.881
	Procrastination	.871
	Distraction and Suppression	.908
	Repression and Denial	.863
	Distress Endurance	.864
	<b>EA_TOTAL</b>	.952
<i><b>Resistance to Change</b></i>	Routine Seeking	.699
	Emotional Reaction	.794
	Short-term Focus	.805
	Cognitive Rigidity	.783
	<b>RTC_TOTAL</b>	.846
<i><b>Functional Impulsivity</b></i>	<b>DII_TOTAL</b>	.747
<i><b>Big Five Factors</b></i>	Extraversion	.847
	Agreeableness	.796
	Conscientiousness	.755
	Neuroticism	.854
	Openness to Experience	.732
<i><b>Overall Dysfunction</b></i>	<b>ZTOTAL</b>	.937

**Demographics**

Participants' ages ranged from 18 to 44, with a mean of 19.26, a mode and median of 19, and a standard deviation of 2.26. Participants identified as male (n = 113), female (n = 73), or transgender (n = 1). For the purpose of examining gender as a potential confounding variable, gender was dichotomously re-coded into either male (n = 113) or not male (n = 74).

**Chi-square**

It was hypothesized that the Reality and Stay groups would be significantly larger than Machine and Leave groups, and that the Leave group would be the smallest group (Hypotheses I and II). A chi-square goodness of fit test was conducted to determine whether distribution of the

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groups formed (Reality, Machine, Stay, Leave) were uneven. Group membership was not equally distributed;  $\chi^2$  ( $df = 3$ ,  $n = 187$ ) = 62.35,  $p < .001$ . The Reality group had the highest membership ( $n = 87$ ) and the Leave group had the lowest membership ( $n = 12$ ).

Table 3

### *Group membership totals*

Group	Observed N	Expected N	Residual	Percentage
Reality	87	46.8	40.3	47%
Machine	38	46.8	-8.8	20%
Stay	50	46.8	3.3	27%
Leave	12	46.8	-34.8	6%
Total	187			

## Bivariate Correlations

Pearson correlations were computed and tested for significance to examine the relationship between decision-making and personality scales (see Table 3). Authenticity was strongly negatively correlated with experiential avoidance, resistance to change, and functional impulsivity (all  $p$ -values  $< .01$ ), and experiential avoidance, resistance to change, and functional impulsivity were strongly positively correlated with each other (all  $p$ -values  $< .01$ ).

The Big Five personality traits were significantly related to most of the scales, with 21 of the 25 correlations being significant. All Big Five personality traits were strongly correlated with the overall dysfunction measure, with correlations ranging in absolute value from .26 to .59, with neuroticism strongly positively correlated and extraversion, agreeableness, conscientiousness, and openness to experience strongly negatively correlated (all  $p$ -values  $< .001$ ). Extraversion was strongly negatively correlated with experiential avoidance, resistance to change, and functional impulsivity, and strongly positively correlated with authenticity (all  $p$ -values  $< .01$ ). Agreeableness was strongly negatively correlated with experiential avoidance and resistance to change, and strongly positively correlated with authenticity (all  $p$ -values  $< .01$ ).

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Conscientiousness was strongly negatively correlated with experiential avoidance, and strongly positively correlated with authenticity (all  $p$ -values < .01). Neuroticism was strongly negatively correlated with authenticity, and strongly positively correlated with experiential avoidance, resistance to change, and functional impulsivity (all  $p$ -values < .01). Openness to experience was strongly negatively correlated with resistance to change, and strongly positively correlated with authenticity (all  $p$ -values < .01), as well as being moderately negatively correlated with experiential avoidance ( $p = .041$ ).

Table 4

*Bivariate correlations for personality scales, decision-making scales, and aggregate measure of dysfunction*

Scale		1	2	3	4	5	6	7	8	9	10
<u>1. Authenticity</u>	Pearson r	1	-.541**	-.251**	-.389**	-.755**	.331**	.321**	.433**	-.526**	.227**
	Sig. (2-tailed)		.000	.001	.000	.000	.000	.000	.000	.000	.002
<u>2. Experiential Avoidance</u>	Pearson r		1	.392**	.367**	.796**	-.198**	-.254**	-.417**	.488**	-.150*
	Sig. (2-tailed)			.000	.000	.000	.007	.000	.000	.000	.041
<u>3. Resistance to Change</u>	Pearson r			1	.237**	.651**	-.240**	-.250**	-.009	.273**	-.296**
	Sig. (2-tailed)				.001	.000	.001	.001	.905	.000	.000
<u>4. Functional Impulsivity</u>	Pearson r				1	.689**	-.393**	.046	-.061	.420**	-.067
	Sig. (2-tailed)					.000	.000	.530	.405	.000	.363
<u>5. Overall Dysfunctionality</u>	Pearson r					1	-.402**	-.269**	-.318**	.591**	-.256**
	Sig. (2-tailed)						.000	.000	.000	.000	.000
<u>6. Extraversion</u>	Pearson r						1	.221**	.151*	-.273**	.335**
	Sig. (2-tailed)							.002	.039	.000	.000
<u>7. Agreeableness</u>	Pearson r							1	.368**	-.336**	.264**
	Sig. (2-tailed)								.000	.000	.000
<u>8. Conscientiousness</u>	Pearson r								1	-.313**	.046
	Sig. (2-tailed)									.000	.532
<u>9. Neuroticism</u>	Pearson r									1	-.014
	Sig. (2-tailed)										.850
<u>10. Openness</u>	Pearson r										1
	Sig. (2-tailed)										

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

**\*** Correlation is significant at the 0.05 level (2-tailed).

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### Gender Differences

A MANOVA was conducted to determine there were gender differences among the five measures: authenticity, experiential avoidance, resistance to change, functional impulsivity, overall dysfunctionality. There was a statistically significant overall difference between male and non-male participants on the set of total scores for the five measures [ $F(4, 187) = 4.071, p = .003$ , Wilks'  $\Lambda = .918$ ].

A series of ANOVAs was conducted to determine if there were differences for each measure. There were statistically significant differences between male and non-male participants on the experiential avoidance scale [ $F(1, 187) = 6.852, p = .010$ , partial  $\eta^2 = .036$ ], such that males were significantly less avoidant ( $M = 196.16$ ) than non-males ( $M = 212.76$ ). There were also significant differences on the functional impulsivity scale [ $F(1, 187) = 11.478, p = .001$ , partial  $\eta^2 = .058$ ], such that males were significantly less functionally impulsive ( $M = 15.876$ ) than non-males ( $M = 17.297$ ). Finally, there were significant differences on the overall dysfunction measure [ $F(1, 187) = 6.381, p = .012$ , partial  $\eta^2 = .033$ ], such that males were significantly less dysfunctional overall ( $M = -.426$ ) than non-males ( $M = .650$ ).

There were no statistically significant differences in the measures of authenticity [ $F(1, 187) = 1.011, p = .316$ , partial  $\eta^2 = .005$ ], or resistance to change [ $F(1, 187) = .101, p = .751$ , partial  $\eta^2 = .001$ ].

Additionally, a Chi-square independence test was conducted to determine if gender was related to Reality-Machine group membership. Gender was significantly associated with Reality-Machine group membership;  $\chi^2 (df = 3, n = 187) = 4.522, p = .210$ . In order to more fully interpret this nonsignificant finding, statistical power was assessed. According to Cohen's (1992) power

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table for Chi-square, the current sample size ( $N = 187$ ) was sufficient to detect a medium and large effect size at Power = .80 and  $\alpha = .05$ .

Table 5

*Chi-square independence test between group and gender*

		Group					
		Reality	Machine	Stay	Leave	Total	
Gender	Male	Count	54	27	27	5	113
		Expected Count	52.6	23.0	30.2	7.3	113.0
		% within Gender	47.8%	23.9%	23.9%	4.4%	100.0%
		% within Group	62.1%	71.1%	54.0%	41.7%	60.4%
		% of Total	28.9%	14.4%	14.4%	2.7%	60.4%
	Non-male	Count	33	11	23	7	74
		Expected Count	34.4	15.0	19.8	4.7	74.0
		% within Gender	44.6%	14.9%	31.1%	9.5%	100.0%
		% within Group	37.9%	28.9%	46.0%	58.3%	39.6%
		% of Total	17.6%	5.9%	12.3%	3.7%	39.6%

### Overall Differences (Multivariate)

As noted earlier, responses to the scenarios allowed participants to be classified into the four Reality-Machine groups. A MANCOVA was conducted to determine if there were overall differences among the four Reality-Machine groups on the set of total scores for authenticity, experiential avoidance, resistance to change, and functional impulsivity, while controlling for the Big Five Personality Factors and gender. There were no significant differences [ $F(12, 187) = 1.405, p = .160, \text{Wilks' } \Lambda = .909$ ].

### Group Differences in Overall Scale Scores (Univariate)

A series of ANCOVAs were conducted to determine if there were differences for each complete measure. There was a statistically significant difference in mean authenticity scores based on Reality-Machine group membership, when controlling for the Big Five Personality Factors and gender [ $F(3, 187) = 3.798, p = .011, \text{partial } \eta^2 = .060$ ].

A Fisher LSD post-hoc test was conducted, and it was determined that the Reality group was significantly more authentic than the Leave group (Mean difference = 9.919,  $p = .002$ ) and



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the Stay group was significantly more authentic than the Leave group (Mean difference = 7.807,  $p = .017$ ).

There were no statistically significant differences in the measures of experiential avoidance [ $F(3, 187) = .399, p = .754$ , partial  $\eta^2 = .007$ ], resistance to change [ $F(3, 187) = 1.534, p = .207$ , partial  $\eta^2 = .025$ ], or functional impulsivity [ $F(3, 187) = .827, p = .481$ , partial  $\eta^2 = .014$ ] based on Reality-Machine group membership, while controlling for the Big Five Personality Factors and gender.

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Table 6

*Adjusted scale and subscale means and standard errors by group membership*

<i><b>Measure</b></i>	<i><b>Scale</b></i>	<i><b>Reality (N= 87)</b></i>		<i><b>Machine (N= 38)</b></i>		<i><b>Stay (N= 50)</b></i>		<i><b>Leave (N= 12)</b></i>	
		<b>Mean</b>	<b>SE</b>	<b>Mean</b>	<b>SE</b>	<b>Mean</b>	<b>SE</b>	<b>Mean</b>	<b>SE</b>
<i><b>Authenticity</b></i>	Authentic Living	21.89	0.44	21.30	0.67	21.24	0.58	18.46	1.20
	Acceptance of External Influence	18.45	0.53	17.35	0.80	16.14	0.70	14.83	1.44
	Self-alienation	19.24	0.52	17.57	0.78	20.09	0.68	16.38	1.40
	<b>AUTH_TOTAL</b>	<b>59.58</b>	<b>1.08</b>	<b>56.23</b>	<b>1.62</b>	<b>57.47</b>	<b>1.43</b>	<b>49.67</b>	<b>2.92</b>
<i><b>Experiential Avoidance</b></i>	Behavioral Avoidance	37.50	0.98	37.70	1.48	38.21	1.30	40.24	2.66
	Distress Aversion	42.69	1.18	44.04	1.78	44.06	1.56	44.05	3.20
	Procrastination	26.13	0.62	26.90	0.93	27.75	0.81	26.84	1.67
	Distraction and Suppression	26.13	0.78	26.19	1.18	26.46	1.03	25.96	2.12
	Repression and Denial	39.08	1.03	41.26	1.55	37.45	1.36	40.97	2.78
	Distress Endurance	48.54	0.80	47.98	1.21	46.99	1.06	45.03	2.17
	<b>EA_TOTAL</b>	<b>199.98</b>	<b>3.88</b>	<b>205.12</b>	<b>5.83</b>	<b>203.94</b>	<b>5.12</b>	<b>210.03</b>	<b>10.48</b>
<i><b>Resistance to Change</b></i>	Routine Seeking	14.44	0.39	14.73	0.59	15.61	0.51	14.06	1.05
	Emotional Reaction	13.29	0.42	14.50	0.63	14.81	0.55	14.69	1.13
	Short-term Focus	12.41	0.39	13.43	0.59	13.26	0.51	13.11	1.05
	Cognitive Rigidity	13.85	0.38	12.85	0.57	14.40	0.50	13.31	1.03
	<b>RTC_TOTAL</b>	<b>53.99</b>	<b>1.14</b>	<b>55.50</b>	<b>1.72</b>	<b>58.08</b>	<b>1.51</b>	<b>55.17</b>	<b>3.09</b>
<i><b>Functional Impulsivity</b></i>	<b>DII_TOTAL</b>	<b>16.22</b>	<b>0.26</b>	<b>16.90</b>	<b>0.39</b>	<b>16.36</b>	<b>0.34</b>	<b>16.86</b>	<b>0.71</b>
<i><b>Overall Dysfunction</b></i>	<b>ZTOTAL</b>	<b>-0.41</b>	<b>0.23</b>	<b>0.33</b>	<b>0.35</b>	<b>0.25</b>	<b>0.31</b>	<b>0.91</b>	<b>0.63</b>

## REALITY-MACHINE: THOUGHT EXPERIMENT FOR PSYCHOTHERAPY

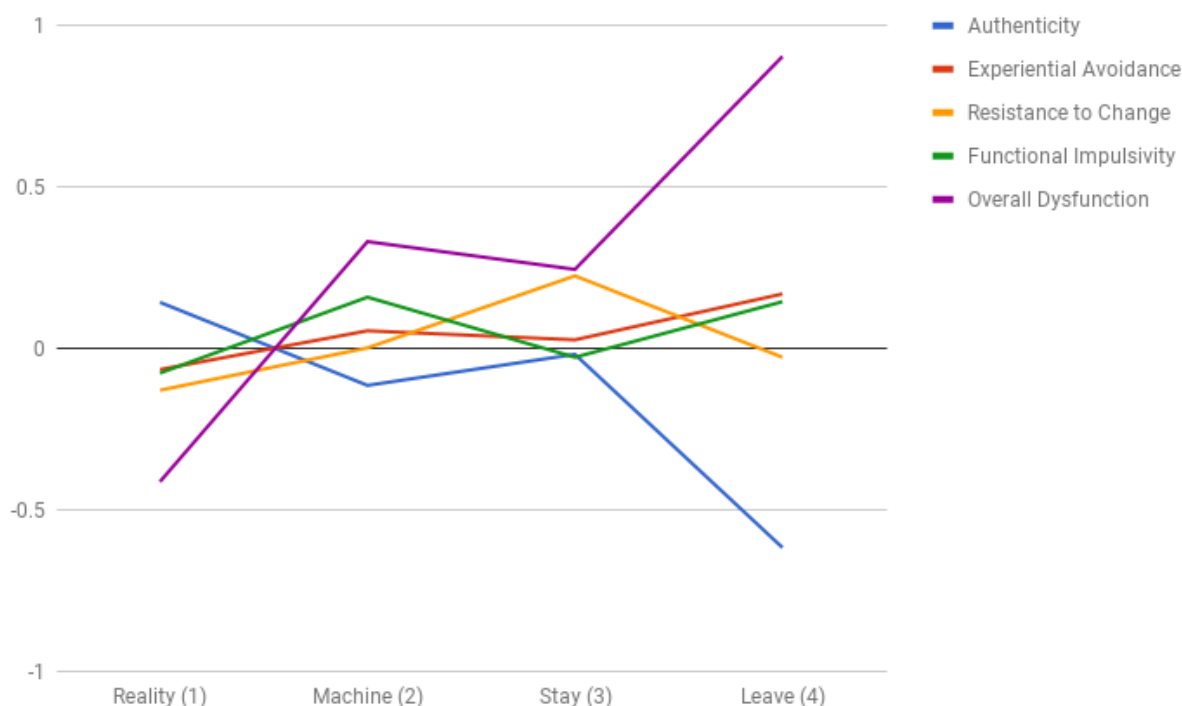


Figure 2. Adjusted z-scores for authenticity, resistance to change, experiential avoidance, functional impulsivity, and overall dysfunction

### Group Differences in Overall Subscale Scores (Multivariate)

A series of MANCOVAs were conducted to determine if there were group differences at the subscale level for authenticity, experiential avoidance, and resistance to change. Functional impulsivity had no subscale. Again, the Big Five personality traits and gender served as covariates in these analyses.

The MANCOVA conducted on the authenticity subscales (Authentic Living, Accepting External Influence, and Self-Alienation) yielded a significant overall difference between groups with regard to the authenticity subscales [ $F(9, 187) = 2.619, p = .006$ , Wilks'  $\Lambda = .877$ ]. A series of ANCOVAs were conducted to determine if there were significant group differences for each authenticity subscale. There were significant differences between groups on the Accepting External Influence subscale [ $F(3, 187) = 3.358, p = .020$ , partial  $\eta^2 = .054$ ] and on the Self-

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Alienation subscale [ $F(3, 187) = 3.236, p = .024$ , partial  $\eta^2 = .052$ ]. There were no significant differences between groups on the Authentic Living subscale [ $F(3, 187) = 2.427, p = .067$ , partial  $\eta^2 = .040$ ].

Fisher LSD post-hoc tests were conducted, and it was determined that significant group differences were found between groups in both the Accepting External Influence subscale and the Self-Alienation subscale. For the Accepting External Influence subscale (reverse scored), the Reality group was significantly less willing to accept external influence than both the Stay group (Mean difference = 2.310,  $p = .010$ ) and the Leave group (Mean difference = 3.626,  $p = .020$ ). For the Self-Alienation subscale (reverse scored), the Stay group was less self-alienated than the Machine group (Mean difference = 2.519,  $p = .016$ ) and the Leave group (Mean difference = 3.715,  $p = .018$ ).

The MANCOVA conducted on the experiential avoidance subscales (Behavioral Avoidance, Distress Aversion, Procrastination, Distraction and Suppression, Repression and Denial, and Distress Endurance) determined that there was no significant overall difference between groups with regard to the set of experiential avoidance subscales [ $F(18, 187) = .749, p = .760$ , Wilks'  $\Lambda = .926$ ].

The MANCOVA conducted on the resistance to change subscales (Routine Seeking, Emotional Reaction, Short-term Focus, and Cognitive Rigidity) determined that there was no significant overall difference between groups with regard to the resistance to change subscales [ $F(12, 187) = 1.132, p = .331$ , Wilks'  $\Lambda = .926$ ].

### **Confidence (Multivariate)**

A MANCOVA was conducted to determine if there were overall differences on the measure of confidence in one's decision for the two scenarios, based on Reality-Machine group

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membership, while controlling for the Big Five Personality Factors and gender. There was a significant difference [ $F(6, 187) = 3.037, p = .006$ , Wilks'  $\Lambda = .903$ ].

Two ANCOVAs were conducted to determine if there were differences for the measure of confidence for each scenario. There was no statistically significant difference in confidence for Scenario 1 based on Reality-Machine group membership, while controlling for the Big Five Personality Factors [ $F(3, 187) = 2.315, p = .078$ , partial  $\eta^2 = .038$ ].

There was a statistically significant difference in confidence for Scenario 2 based on Reality-Machine group membership, while controlling for the Big Five Personality Factors [ $F(3, 187) = 3.294, p = .022$ , partial  $\eta^2 = .053$ ].

A Fisher LSD post-hoc test was conducted for Scenario 2 confidence, and indicated the Stay group ( $M = 2.965$ ) was significantly less confident than the Reality group ( $M = 3.592, p = .004$ ) and the Machine group ( $M = 3.565, p = .021$ ).

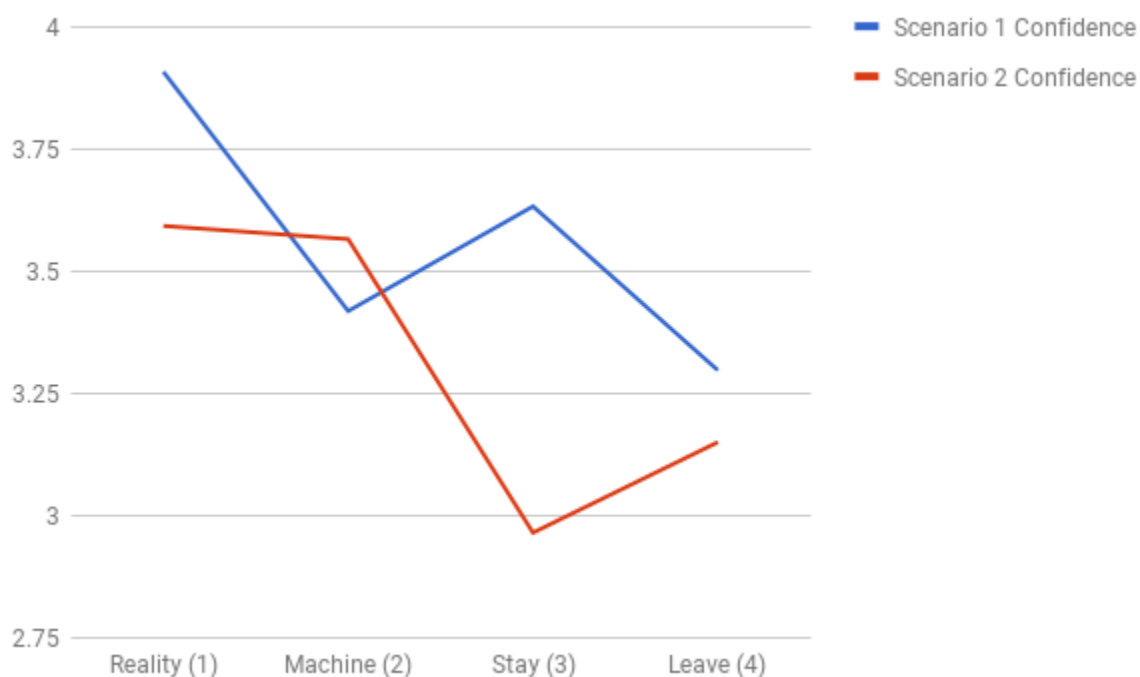


Figure 3. Adjusted group means for Scenario 1 and Scenario 2 response confidence

**Overall Dysfunction (Univariate)**

An ANCOVA was conducted to determine if there were group differences on the aggregate dysfunction measure, ZTOTAL. There was no statistically significant difference on the ZTOTAL scale based on Reality-Machine group membership, while controlling for the Big Five Personality Factors [ $F(3, 187) = 2.214, p = .088, \text{partial } \eta^2 = .036$ ].

## **Discussion**

### **Group Distribution**

The first hypothesis was made under the assumption that Nozick's insight (1974) about people's perception of experience played a significant role in whether or not they would be willing to sacrifice their reality for a more pleasurable simulation of reality. Contrary to Nozick's beliefs, De Brigard (2010) suggested that many would be unwilling to leave the machine (Scenario 2), a view that was expressed by about 47% of the participants ( $n = 88$ ) in this study. Additionally, 27% of the participants ( $n = 50$ ) chose to leave reality and enter the machine (Scenario 1).

However, when presented with the combination of the two scenarios, participants were most likely to choose Reality (47%) over Machine (20%), Stay (27%), or Leave (6%), supporting the first hypothesis. The data revealed that, though De Brigard was right to question Nozick's initial assumptions, there is some inherent value to reality that people find compelling.

The second hypothesis was made under the assumption that only a few people would be willing to defy logical consistency with regard to their state of existence (reality or machine) and also avoid the status quo bias, thus choosing to leave both reality in Scenario 1, and leave the machine in Scenario 2. Only 6% of the participants ended up in the Leave group.

### **Covariates**

Two variables were used as covariates. The Big Five Inventory (BFI) was used as a covariate because of the significant correlations between the five BFI scales and the four main scales. Gender was dichotomized into male and non-male because there was one participant who identified as transgender, and was used as a covariate because there were differences in two of

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the four main scales with regard to gender. The group differences discussed all share the feature of being done with analyses that involved controlling for both the BFI and gender.

### Group Differences

Hypotheses III, IV, V, and VI were attempts at understanding why participants would choose one group over another. It was proposed that four measures of authenticity, experiential avoidance, resistance to change, and functional impulsivity would reveal group differences, suggesting that each of the four measures captured a relevant rationale that factored into one's decision regarding the two scenarios. The assumption was that on the authenticity measure, the Reality group would have the highest scores, on the experiential avoidance measure, the Machine group would have the highest scores, on the resistance to change measure, the Stay group would have the highest scores, and on the functional impulsivity measure, the Leave group would have the highest scores.

**Authenticity.** Of the four measures, authenticity seems to be the most relevant factor when looking at group differences. The data confirmed Hypothesis III, as the Reality group scored the highest on the authenticity measure, and both the Reality and Stay groups were significantly higher than the Leave group. Those in the Reality group used terms such as “hollow” or “fake” to describe their reasons for not accessing the machine option, citing their intention to “rather face the truth.” This seems to reflect their desire for an authentic existence. The authors of the authenticity scale (Wood et al., 2008) did not intend for it to be scored in totality, and rather that it be viewed through its subscales. While the total score suggests that those in the Reality and Machine groups report that they are more authentic than those in the Leave group, it is imperative to look at the subscale differences to get a clearer picture.



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On the Accepting External Influence subscale, those in the Reality group were less inclined than those in both the Stay and the Leave group to allow others' beliefs and values to affect oneself. For the Stay group, this difference may be an indication of an inherent passivity, reflected by the decision to not choose either reality or the machine in particular, but rather to remain unmoved. This difference seems to highlight the compliance of the Stay group, particularly relative to those in the Reality, the latter being more inclined to make a decision that was more their own than another person's decision.

On the Self-alienation subscale, those in the Stay group reported feeling more in-touch with their true selves than those in both the Machine group and the Leave group. This difference may suggest that for those in the Stay group, their sense of connectedness to their self influenced their decision to remain in whatever state, reality or machine, they were placed in. Phrases used by those in the Stay group such as "it is reality to me," "wouldn't want to start over... I like who I am" suggest a sense of comfort with themselves, an acceptance of their personality.

On the Authentic Living subscale, though there were no significant differences, the trends were reflective of the overall authenticity differences, with Reality having the highest score, and Leave having the lowest.

The one consistent feature across the three authenticity subscales was that the Leave group scored the lowest, though not always significantly so. Those in the Leave group appear to be the least connected to themselves, the most likely to be strongly influenced by the opinions of others, and the least likely to be living their lives according to their own values and beliefs. This presents a grim outlook for those in the Leave group with regard to being authentically present, particularly in a therapeutic context. Based on their scores relative to the other three groups, a

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client in the Leave group seems more likely to struggle with their identity, their relationships, their self-esteem, and their general well-being.

**Experiential Avoidance.** It was hypothesized that the Machine group would score the highest on the experiential avoidance scale, but no significant differences were observed between the Reality-Machine groups with regard to experiential avoidance. Although descriptively the trends on the experiential avoidance scale match that of the overall dysfunction metric (ZTOTAL) created by combining the four scales, with Leave having the highest mean score, Stay and Machine having similar means in the middle, and Reality having the lowest mean score, it should be noted that the differences were minimal and non-significant. This suggests that experiential avoidance does not capture the mechanisms of action that propel someone to choose a simulated reality that is more pleasurable than actual reality. It seems that those who choose to both leave reality for the machine (Scenario 1) and stay in the machine instead of leaving for reality (Scenario 2) do not do so as a means to avoid the hardships of their current existence or life. Participants' rationales ranged from statements like "I want my life to be easy and happy," suggesting an attempt at minimizing distress, to "Reality is all about perception and in the end it does not matter if your life is real or not, it's how you live it", suggesting a view that reality is subjective and to them it would not make a difference because perception is paramount. Other qualitative feedback, such as "leaving the machine will make your life worse" or "I want my life to improve, not worsen" suggest that a hedonistic perspective plays a role in one's decision to choose the machine over reality.

**Resistance to Change.** It was hypothesized that the Stay group would score the highest on the resistance to change scale, and although the data reflect that the Stay group scored higher, there was no overall significant difference between groups with regard to resistance to change.

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Many of the responses suggest a loss aversion or fear of change mentality, such as “I would not want to get stuck in a reality I do not know,” “In both scenarios I would fear change too much,” “Whichever scenario I start with is reality to me and I don't want to know something different,” or “If I choose to leave reality and enter into the experience machine, I will be leaving behind people who I care about and who love me who would not be able to enter the experience machine with me and be a part of my simulated experience without being themselves simulations.” Alternatively, some responses suggested a general satisfaction with life, such as “If it ain't broke don't fix it,” or “I'd rather prefer things to stay the way they are.” Perhaps one reason the resistance to change measure did not significantly capture the rationale of those in the Stay group is that there is a blend of the status quo bias, loss aversion, fear of change, and a general satisfaction with life as is. Additionally, limited power may have been a factor, as the targeted N of 217 was 30 more than the number who participated in the study, and the difference between the Stay group and Reality group with regard to resistance to change was close to being significant.

**Impulsivity.** It was hypothesized that the Leave group would score the highest on the impulsivity scale. Initially, the entirety of the Dickman Impulsivity Inventory was going to be used, featuring both the Functional and Dysfunctional Impulsivity subscales. Due to a clerical error, only the Functional Impulsivity subscale was used in the study. Though the depth of the analysis was limited by this error, the positive and significant correlation between Function Impulsivity and Dysfunctional Impulsivity (Dickman, 1990) should allow for some discussion on the matter. The lack of significant differences between Reality-Machine groups with regard to functional impulsivity suggest that it is an irrelevant factor in the decision-making process for the two scenarios. Perhaps if the dysfunctional impulsivity subscale were included, there would be

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significant, or at the very least, relevant and interesting results to discuss with regard to impulsivity and Reality-Machine group membership.

### **Additional Findings**

**Confidence.** After responding to the scenarios, participants were asked to rate how confident they were for each scenario. There was one significant difference in reported confidence between groups for Scenario 1, but for Scenario 2, the significantly lower confidence ratings by the Stay group reveal an important mechanism in the thought process for those in that group. For both scenarios, the Reality group was consistently most confident, having the highest mean confidence in both, and the Leave group lacked confidence, with the lowest mean confidence in Scenario 1 and second lowest in Scenario 2. The Machine group was slightly less confident about Scenario 1 than Scenario 2, suggesting that they were hesitant to leave reality for the machine, perhaps because of the status quo bias. The Stay group's confidence ratings for Scenario 2 reveal the hesitation felt by those in that group about staying in the machine. It seems that they were being pulled toward reality, as they felt relatively strongly in Scenario 1 that staying in reality was optimal, but were much more hesitant to stay in the machine in Scenario 2. Despite ultimately being overcome by their desire to not change their state, those in the Stay group were affected by Nozick's notion of reality being valuable. Perhaps that explains their authenticity scores being higher than those in the Leave group.

**Overall Dysfunction.** The aggregate measure of dysfunction (ZTOTAL) revealed some valuable trends. Though the group differences were nonsignificant, descriptively, the data reflect that the Reality group is the least dysfunctional, the Machine and Stay groups are in the middle, and the Leave group is the most dysfunctional. Although this proposed constructed measure of dysfunction relates only to the four measures used in the study, it seems that the Leave group,

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having rated consistently poorly on said measures, is comprised of those who are struggling in life. Comments such as “I feel like I could make a better life in both,” or “Sometimes, I want to escape reality” suggest a desire to disconnect from, or a sense of dissatisfaction with, their lives. The only participant in the Leave group who rated low on the ZTOTAL scale described their decision as taking advantage of an “opportunity to explore” a new imagined life, suggesting that while most in the Leave group are looking to escape their lives and present with relatively high dysfunctionality, there are some who view it as a unique opportunity to sense something new.

### **Implications**

The purpose of this study was to explore the potential for thought experiments in general, and the Reality-Machine more specifically, to be used in the context of psychotherapeutic assessment and treatment. By assessing the group differences for four measures that have clinical relevance in psychotherapy, it is clear that the Reality-Machine thought experiment provides some potentially valuable insight into authenticity. Although experiential avoidance, resistance to change, and functional impulsivity did not differ according to group membership, authenticity, a crucial element in the emotional well-being of a potential client, varied significantly by group membership. The group differences indicate that those in the Reality, Stay, and to a lesser extent, Machine, groups are relatively more authentic than those in the Leave group, suggesting that those in the Leave group are at a greater risk for anxiety and depression, generally may have lower self-esteem and life satisfaction, and thus are in more desperate need of treatment. Furthermore, this study gives credence to the potential for philosophical thought experiments to function as psychotherapeutic tools, at first for therapists to deepen their understanding of their clients, and later, for clients to explore their decisions, and gain some introspective insight.

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### Limitations

One major limitation for this study is the total number of participants. The goal was to obtain at least 212 participants for adequate power, but only 187 participants had useable data. A few of the claims in this discussion are based on trends that might have been significant were there to have been more participants. Related to the total number of participants is the limitation of the Reality-Machine thought experiment in and of itself. As predicted, the Leave group was the smallest, and thus comparing group differences, even if the averages were more than marginally different, often did not result in a significant p-value. Had there been a comparable number of participants in the Leave group relative to the other groups, and had the averages stayed the same, the claims about overall dysfunction, and a few of the other variables, would have been stronger.

Additionally, the impulsivity measure was limited and unintentionally halved. If the dysfunctional impulsivity subscale had been included as planned, it may have resulted in significant differences between groups, or an interaction effect between the two impulsivity measures. The procedural error of excluding the dysfunctional impulsivity measure limited the analysis of impulsivity as a decision-making factor that influenced the decisions of participants for both scenarios.

As this was a pilot-study, it was known in advance that a major limitation would be the legitimacy of transposing the results onto in-person psychotherapy. The measure was administered online, with no verbal directions or in-person interaction, thus there is reason to believe that even with the significant group differences in authenticity, it might not transpose effectively into actual psychotherapy.

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### **Future Research**

Based on the drastic difference between group membership totals, and on the assumption that those in the Leave group are more likely to be more dysfunctional than those in the other groups, administering the Reality-Machine in a different setting, perhaps one more populated by those with higher levels of psychological dysfunction, would provide more balanced group membership. If wanting to leave your current state for a different one is a primary factor for those in the Leave group, a psychiatric setting or a prison might have a significantly higher percentage of people who would choose to be in the Leave group, and thus could be ideal settings to further explore the group differences.

Given the lack of statistically significant group differences for three of the four measures, perhaps there are other variables that impact the decision-making differently for each group. For example, those in the Machine group tend to reflect a marginally more hedonistic attitude towards life than those in the other groups, so including a measure that reflects that philosophy could be useful. Including a reliable and valid measure for psychological dysfunction would lend more credence to the supposed differences between the Leave group and the other three.

Although this study featured and focused on the Reality-Machine as a proposed thought experiment with psychotherapeutic value, exploring other more established thought experiments could further the claim that thought experiments can be used as psychotherapeutic diagnostic and intervention tools.

Before examining alternative thought experiments, it would be valuable to observe the Reality-Machine in the context of actual therapy to assess its usefulness and practicality. Although it may be valuable on paper as a rudimentary measure of authenticity, it remains to be

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tested in actual therapy. Its functionality is dependent on how well it could be integrated into psychotherapy, and that remains to be determined.

### **Conclusion**

The Reality-Machine, in its entirety, is a novel thought experiment aimed at examining the decision-making process behind choices for two contrasting scenarios involving the interaction between two states (reality or machine) and two actions (stay or leave). In the context of this study, it was proposed that the Reality-Machine choice outcomes, presented as Reality, Machine, Stay, and Leave groups, would relate differently to four measures of personality and decision-making: authenticity, experiential avoidance, resistance to change, and functional impulsivity. The data revealed that there were significant group differences with regard to authenticity, which suggests that authenticity plays an important role in determining group membership, or rather, in affecting the participants' decision-making for each scenario. The Reality and Stay groups scored significantly higher on the authenticity measure than the Leave group, and the latter consistently scored higher on the other three decision-making scales that reflected dysfunctionality in decision-making. This suggests that the Leave group may have greater therapeutic needs, lower self-esteem, and lower emotional well-being than the other groups. Given its status as a pilot study, further research is needed to determine whether it would be an effective tool in psychotherapy. It is imperative to recognize that the Reality-Machine is still a self-report measure. However, it requires people to consider abstract and hypothetical choices, and may only indicate a person's ideal self. Although this may seem like a drawback, in the context of psychotherapy, it would provide a valuable medium to discuss and process discrepancies between what one wishes one would do (ideal self) and what one actually does (actual self). It constitutes an indirect measure, less transparent than the typical self-report



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measure. Consequently, it should be less susceptible to intentional impression management or social desirability. The results at hand suggest that it could be a valuable tool to explore a client's sense of authenticity, and, if they choose to be in the Leave group, a preliminary warning sign for at-risk clients.

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## Appendix A

## Consent Form for Anonymous Data Collection

[For Pilot]

You are invited to participate in a research study that is being conducted by Evan Kalkus, who is a doctoral candidate in the Graduate School of Applied and Professional Psychology at Rutgers University. The purpose of this research is to determine whether or not the scenarios presented are clear and understandable.

Approximately 40 subjects will participate in the study, and each individual's participation will last approximately 10 minutes. The study procedures include responding to two related scenarios, and rating how understandable they are.

This research is anonymous. Anonymous means that no information will be recorded about you that could identify you. There will be no linkage between your identity and your response in the research. This means that your name, address, phone number, date of birth, etc. will not be recorded. If you agree to take part in the study, this form will be removed your test materials so that I will not know your identity from your signature. You will receive 5 extra credit points in class.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. All study data will be kept for two years after the last paper is published.

There are no foreseeable risks to participation in this study. In addition, you may receive no direct benefit from taking part in this study, aside from earning the 5 extra credit points.

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Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you.

If you have any questions about the study or study procedures, you may contact Evan Kalkus at GSAPP, Rutgers University, 152 Frelinghuysen Rd., Piscataway, NJ 08854. The contact number is [REDACTED], and the email address is [evan.kalkus@rutgers.edu](mailto:evan.kalkus@rutgers.edu). If you have any questions about your rights as a research subject, please contact an IRB Administrator at the Rutgers University, Arts and Sciences IRB:

Institutional Review Board Rutgers University, the State University of New Jersey

Liberty Plaza / Suite 3200

335 George Street, 3rd Floor

New Brunswick, NJ 08901

Phone: [REDACTED] Email: [humansubjects@orsp.rutgers.edu](mailto:humansubjects@orsp.rutgers.edu) Attachment 4b

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*For IRB Use Only. This Section Must be Included on the Consent Form and Cannot Be Altered*

*Except For Updates to the Version Date. Version Date: v1.0 Page 2 IRB Stamp Box IRB Stamp*

Box

REALITY-MACHINE: THOUGHT EXPERIMENT FOR PSYCHOTHERAPY

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Please retain a copy of this form for your records. By participating in the above stated procedures, then you agree to participation in this study.

If you are 18 years of age or older, understand the statements above, and will consent to participate in the study, check the box and sign next to "I Agree" to begin the study. If not, please check the box and sign next to "I Do Not Agree".

I agree to participate in the study

Your signature: \_\_\_\_\_ Date: \_\_\_\_\_

I do not agree to participate in the study

Your signature: \_\_\_\_\_ Date: \_\_\_\_\_

# REALITY-MACHINE: THOUGHT EXPERIMENT FOR PSYCHOTHERAPY

## Appendix B

### Pilot study

#### The Reality-Machine

Scenario 1: You are in reality. Everything around you is definitively real and actual. Your experiences are true in nature and are not illusions. Your family, friends, and possessions are real and exist. However, there is an experience machine that you may enter. If you choose to enter this machine, your life will improve. You cannot become immortal, but the experiences you value in life will be better than they were in reality. You will spend the rest of your life in the machine experiencing what will feel like reality to you. If you enter the machine, your experiences will not be real, but to you, they will seem to be. You will believe that what you are experiencing is reality, and this experience will be better than your current life. Your created life can be completely different, or a slightly improved version of your own. You may keep all of your friends and family members, or you can create new ones. If you enter the machine, you will not have an opportunity to leave, because you will not be aware that it is a machine. You could also stay in reality, but you will remember the opportunity you had to enter the machine.

Scenario 2: You are in an experience machine. Everything around you is a projection of reality. Your experiences are not actually happening and they are illusions. Your family, friends, and possessions are not real and do not exist. However, you are now aware of this and may leave the machine and enter reality. If you choose to leave this machine, your life will worsen. You will spend the rest of your life in reality

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experiencing the actual world. You will not only believe what you are experiencing is real, but you will know it is so, though it will be worse than your life in the machine. Your life outside the machine may be similar or distinct from your life inside the machine. You could also choose to stay in the machine, and in doing so, you would forget that you are in a machine and believe that your life is real and actual. You will not receive another opportunity to leave the machine.

The difference in experience should be the same in each scenario. If going to the machine in Scenario 1 gets you a better phone, leaving the machine in Scenario 2 would have you getting a worse phone than the one you have.

Having read through each scenario, what would you choose to do?

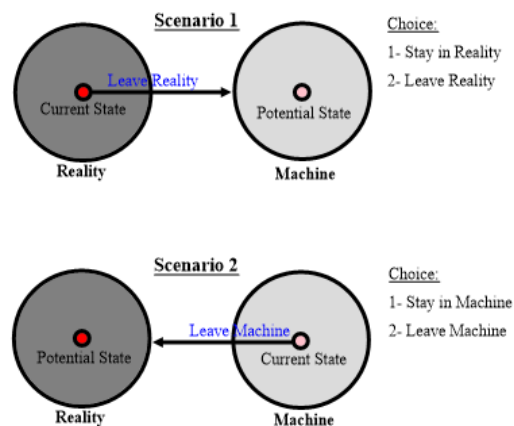
In Scenario 1, do you stay in reality, or leave and enter the machine?

[STAY] [LEAVE]

In Scenario 2, do you stay in the machine, or leave and enter reality?

[STAY] [LEAVE]

Figure 1: Diagram of Reality-Machine Scenarios



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On a scale from 1 to 6, please rate the understandability of the scenarios

- 1- Very difficult to understand
- 2- Difficult to understand
- 3- Somewhat difficult to understand
- 4- Somewhat easy to understand
- 5- Easy to understand
- 6- Very easy to understand

A- Is there anything about the situation described in the scenario that wasn't totally clear?

Please describe the part that wasn't clear enough.

B- Is there anything about what I'm asking you to decide that wasn't totally clear?

Please describe it as best as you can.

C- Is there any other feedback that you think might help me make this task clearer?

D- Please make any other comments or suggestions here:

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