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A Framework for the Pursuit of Happiness: Personality as It Relates to Subjective Well-being

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CLAREMONT McKENNA COLLEGE
A FRAMEWORK FOR THE PURSUIT OF HAPPINESS:
PERSONALITY AS IT RELATES TO SUBJECTIVE WELL-BEING

SUBMITTED TO
DR. KATHLEEN BROWN
AND
DEAN NICHOLAS WARNER
BY
EMMA LUDLUM

FOR
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To be, or not to be, happiness is the question.

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Chapter 1

Introduction

An ancient mystery of the human experience, happiness is the goal of most, yet a single concrete definition does not exist. Many have theorized about how happiness is obtained, leading questions to arise such as how much of happiness is predetermined? Are some more likely than others to experience happiness? How much do environmental factors affect the achievement of happiness? This paper will explore how human personality affects happiness, whether positive illusions facilitate happiness, and whether those who are less happy are more realistic. I will begin by giving a brief background of personality psychology, involving theories and current definitions of personality dimensions. Next I will explore philosophical, biological and psychological theories of happiness and how they have evolved over time.

After the background on both personality psychology and happiness, an investigation of whether or not personality is biologically determined or environmentally driven will address the question of whether some people (based on personality) are predisposed to being happy. This investigation will include current studies in genetics, biology and neuroscience.

I will go on to review psychological studies on the relationship between personality and psychological well-being. This section will show which aspects of personality are relevant to happiness. I will explore studies which test extraversion, introversion, neuroticism, positive affect, and negative affect.

After establishing this relationship, I will explore positive illusions in two aspects. The first will be an exploration of the relationship between positive illusions and subjective well-being. This part will examine studies which attempt to answer the question of whether or not those who have an optimistic mindset experience happiness to a greater extent. The second part of this section will show how positive illusions can be implemented through cognitive therapy.

Lastly, it will be important to ask the question of whether or not happiness should be a life goal. According to the theory of Depressive Realism, depressed people are more realistic. Learning about Depressive Realism prompted my interest in this topic for my senior thesis. I attempt to keep a positive mindset, because I believe it maintains my happiness. I have come to this conclusion because the saddest periods of my life have coincided with me straying from a positive mindset. I was curious to see if my personality and biology allow me to think positively, and whether a positive mindset is unrealistic. Furthermore, obtaining happiness affects most people, so I hope that this paper may provide insight for those struggling to find happiness or those helping others find happiness.

Sources for this paper include fields ranging from neuroscience, genetics, psychology, philosophy, history, and personal experience. The myriad of fields provide a rich understanding of this topic from multiple perspectives because happiness and personality are concepts that are not confined to one particular field. Drawing from only one field would lead to a misrepresentation of this topic from a singular perspective.

Chapter 2

History of Personality Psychology

The first theorists of personality psychology emerged in the 1800s. Prominent theorists such as Sigmund Freud, Carl Jung, Eysenck, Alfred Adler and Karen Horney will be discussed in this chapter. These different theorists built off of each other, but each had unique ideas about what causes personality. Explaining each theorist will illuminate how these individuals have affected personality psychology today.

Sigmund Freud

Sigmund Freud is the founding father of psychoanalysis, which uses therapy to retrieve thoughts from the unconscious part of the mind. Freud believed that the mind was divided into three separate parts: the conscious, preconscious, and unconscious. The conscious is the smallest part of the mind and contains the thoughts one is aware of. The preconscious is similar to long-term memory; it houses information that one can be conscious of when it is retrieved. The last and largest part of the mind is the subconscious, which contains suppressed thoughts which cause an individual anxiety. Individuals are not aware of the content within the unconscious, so anxiety inducing thoughts are suppressed to the unconscious to avoid the negative emotion of anxiety. However, thoughts within the unconscious could affect an individual's behavior. Psychoanalysis is the method of helping a patient discover the thoughts within the unconscious to explain a patient's current behaviors and help that patient get over his or her anxiety.

Freud is also well known for his psychosexual theory of the stages of development. His psychosexual stages are different time periods of life: Oral (birth-1.5 years), Anal (1.5-3 years), Phallic (3-6 years), Latency (6-puberty), and Genital (puberty-death). Energy can be stuck at any stage if an individual did not receive the correct amount of parental gratification during that stage. This is called fixation. Thoughts resulting from fixation cause anxiety and therefore get transferred to the unconscious, to protect against experiencing anxiety. Different types of neuroses occur from fixation at different stages. For example, Freud believed that alcoholics were a result of too much parental gratification at the Oral stage. However, fixation at the Latency stage would result in homosexuality. This illustrates how Freud's theory may be well known and recognized, but is not completely accurate.

Freud believed that the core qualities of one's personality were determined by the age of six, but a neurosis could exhibit itself throughout life. This inspired the question of whether personality is dynamic or innate. Furthermore, once personality develops, can it change? This reflects the crucial debate in personality psychology, which strives to determine if personality is innate or dictated by the environment. Freud is therefore a prominent figure in personality psychology because he incited this debate which is the crux of personality psychology research today.

Carl Jung

Another noteworthy theorist is Carl Jung who was the first to define extraverts and introverts, the two most studied personality dimensions today. Jung and Freud were friendly colleagues who compared theories often. Freud admired Jung and wanted Jung

to be his successor when he retired, but later in their friendship, Jung and Freud parted ways over theoretical disagreements. Jung's divergence from Freud led him to focus on self-realization, or the desire for a balanced sense of self, as the motivation for human behavior. "Transcendence" was the term Jung used for achieving self-realization. This provided an individual with a balanced mindset, which helped an individual face the difficulties of life.

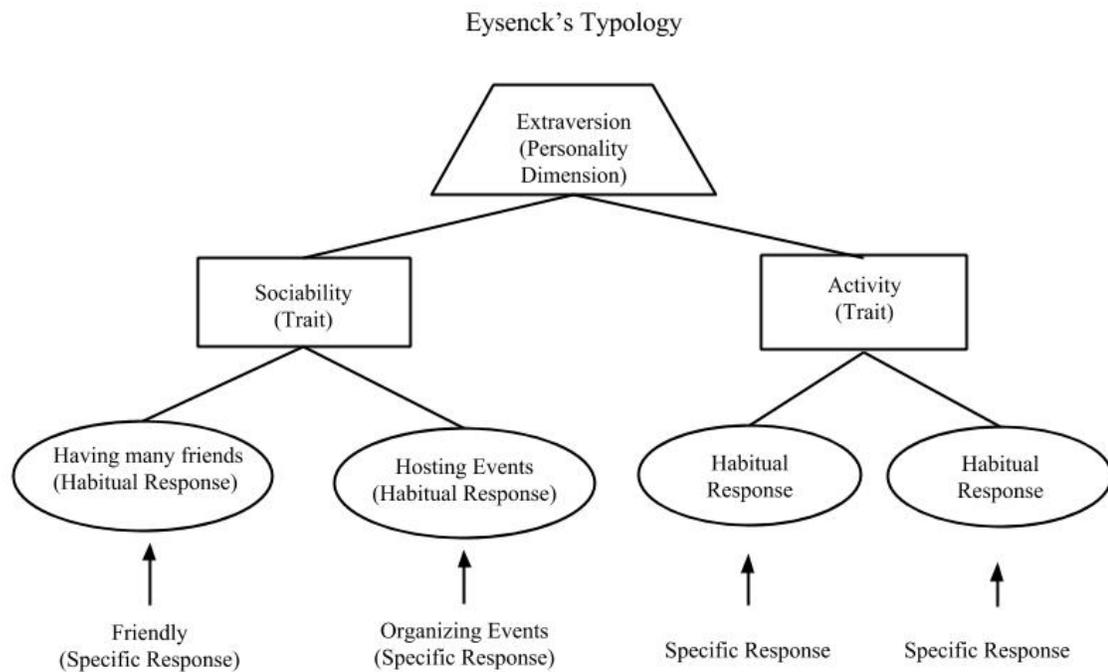
Jung believed that achieving transcendence relied upon fluctuations between introversion and extraversion throughout life. Jung expanded further on this idea by showing how individuals can be extroverted in some areas and introverted in other areas by pairing extroversion and introversion with the four functions: thinking, feeling, sensing and intuiting. Jung said those who are the extraverted intuitive type use clues from the external world to reach intuitive conclusions about people. For example, a politician would be the extraverted intuitive type, so she can read her constituents and know how to present herself to win the race. However, Jung acknowledged that this politician could also be an introverted feeling type who showed no emotion. Thus, Jung was among the first to define and refine extraversion and introversion, which greatly improved personality psychology at the time.

Hans Eysenck

One of the later psychologists who further refined extraversion and introversion was Hans Eysenck. He created the Eysenck Personality Questionnaire, which is one of the most commonly used scales to measure personality today. Eysenck created this scale because he sought to bridge the gap between personality psychologists who rely on

individual differences as data for theories, and experimental psychologists who ignore individual differences for the sake of collecting empirical evidence. Eysenck believed that the most accurate way to study personality was to identify categories of personality, create measurements for each category, and to use these measurements in empirical studies (Ryckman, 2013).

To identify the main dimensions of personality Eysenck devised a typology which was a hierarchy of aspects that comprise different personalities. At the bottom are specific responses to particular situations which add together to create habitual responses. Multiple habitual responses added together make a trait, and many traits comprise one personality dimension. For example, one may always organize events, which is a specific response that leads to the habitual response of always hosting events. Being friendly could be another specific response, which leads to the habitual response of having many friends. Having many friends and hosting events combine to create the trait of sociability. Sociability matched with other traits such as being active comprise the personality dimension of extraversion. The figure on the next page provides a visual for this example.



Extraversion. Eysenck defined extraversion as a combination of traits such as sociable, lively, active, assertive, sensation-seeking, carefree, dominant, surgent, and venturesome (Eysenck, 1947; Ryckman, 2013). Other more recent studies have expanded this definition to include descriptors such as outgoing, friendly, talkative (Weiss, Bates, & Luciano, 2008) up-beat, and optimistic (McCrae & Costa, 2003). Others have indicated behaviors such as under-aroused causing extraverts to seek novelty (Fischer, Wik, & Fredrikson, 1997; Golimbet, Alfimova, Gritsenko, & Ebstein, 2007). Lastly, extraverts are seen as basing their reality off of the external world rather than introspection (Ryckman, 2013).

Introversion. Introversion can be thought of as the opposite of extraversion. Introverts tend to be introspective, quiet, shy, aloof, and clearly organized (Eysenck, 1947). Some have extended this to incorporate a lack of confidence, energy, and activity (Hermes, Hagemann, Naumann & Walter, 2011).

Neuroticism. Neuroticism is a measurement that both extraverts and introverts can possess. To Eysenck neuroticism was a degree of emotionality (Eysenck, 1967; Gray, 1970). Those who exhibit high neuroticism tend to excessively worry, experience anxiety, appear anxious, and frequently experience negative moods. High neuroticism can also lead to insecurity and self-consciousness (McCrae & Costa, 1987). Low levels of neuroticism relate to an emotionally stable demeanor which is calm, predictable, self-confident and comfortable (Hermes et al., 2011).

Psychoticism. Eysenck viewed psychoticism as an exaggerated form of neuroticism (Eysenck, 1967). Psychoticism manifests in complete disregard for social rules and others. This typically leads to cruelty, hostility, and conscious inhumane acts toward others. Psychotics also tend to be egocentric and unempathetic (Ryckman, 2013).

Positive affect. Positive affect is the experience of positive emotions such as joy, pleasantness, and excitement (Costa & McCrae, 1980). An individual exhibiting high positive affect would be highly energetic, focused, joyful, and pleasant to be around. Low positive affect would include sorrow, listlessness, and inertia (Hermes et al., 2011; Watson, Clark, & Tellegen, 1988). Positive affect has been positively correlated with extraversion (Argyle & Lu, 1990; Costa & McCrae, 1980; Hills & Argyle, 2001; Lucas &

Fujita, 2000). Some claim that positive affect is the core of extraversion (Hermes et al., 2011; Lucas, Le, & Dyrenforth, 2008; Vitterso, 2001).

Negative affect. Negative affect is the experience of negative emotions resulting in negative moods such as sadness, anger, and fear (Hermes et al., 2011). High negative affect is characterized by extreme and abrasive moods such as fury, disdain, judgement, guilt, and nervousness, while low negative affect results in a relaxed appearance (Watson et al., 1988). Negative affect has also been correlated with neuroticism and introversion (Costa & McCrae, 1980).

Positive affect and negative affect. Positive affect and negative affect are independent from each other (Bradburn, 1969; Costa & McCrae, 1980; Watson et al., 1988). Bradburn found that each type of affect was correlated independently to different environmental factors and found no correlation between the two affects. This latter relationship was later replicated by Watson et al. (1988) and Costa and McCrae (1980) who found that positive affect and negative affect related to extraversion and introversion differently. A positive relationship was found between extraversion and positive affect, while no relationship was found with negative affect. Conversely, introversion was correlated with negative affect, but not positive affect. This indicates that positive affect and negative affect are two independent emotions, suggesting that individuals can experience both positive and negative affect simultaneously.

Key to understanding this independent relationship is resisting the tendency to view negative affect as the opposite of positive affect. While counterintuitive to think that one can experience negative and positive moods at the same time, it helps to compare the

affects to happiness. One cannot be happy and unhappy at the same time, but one can consider themselves a happy person caused by high positive affect, but have a bad day in which they experience negative affect (Argyle, 1987).

Alfred Adler and Karen Horney

Alfred Adler and Karen Horney are relevant because they were among the first to identify mediating factors between personality and happiness. Adler believed that the motivation for human behavior was the need to better oneself. He called this “striving for superiority” (Ryckman, 2013), and the end goal was psychological health or happiness. For Adler, expectations of the future caused the strive for superiority. Therefore, an individual’s view of the future could lead to happiness through the mediating role of self-improvement. For Adler optimism was a positive mediator between personality and happiness, meaning that higher optimism would lead to higher subjective well-being. This idea will be revisited in the chapter on positive illusions.

Karen Horney was the first to view culture as the most influential mediator between personality and happiness. She believed that the motivation for behavior was the desire to satisfy the need for affection and love, and that parents were responsible for delivering this during childhood. If the parents failed to provide enough love and affection to their child, the child would experience anxiety.

Horney believed culture was an influential mediator because it could affect parenting styles and in turn affect the amount of parental affection given to a child. Horney lived in both England and America, so she had a deep understanding of both cultures. She determined that the American culture of hyper-competitiveness led

American parents to scold and criticize their children, which led to unconscious feelings of insignificance and anxiety. Horney concluded that because culture can affect parenting styles, culture affects an individual's level of happiness in adulthood.

Adler and Horney are noteworthy because a large portion of personality psychology is devoted to mediators between personality and subjective well-being (happiness). Some studies have looked at optimism as a mediator, which directly reflects Adler's theory (Jibeen, 2014). Other studies reflect Horney's theory by studying culture as a potential mediator (Diener, Oishi, & Lucas, 2003; Francis, Brown, Lester, & Philipchalk, 1998).

The exploration of mediators between personality and happiness is a significant portion of personality psychology research today. However, this paper will only further discuss relevant mediators such as positive affect, sociability, and reward systems in the chapter on extraversion and subjective well-being.

This historical background of personality psychology illustrates how these five theorists have impacted the field today. With this understanding I turn to an explanation of happiness.

Chapter 3

Happiness

Countless books have been written on happiness, yet one concrete definition of happiness is still needed. This chapter will explore different definitions of happiness drawn from philosophers and psychologists. It will start with philosophers to show how general happiness has been defined and then move to theories of the biology and psychology of happiness.

Philosophy

Aristotle. Eudaimonia was the term Aristotle used to refer to happiness, and he asserted that happiness was the fulfillment of one's potential. Aristotle used a metaphor of an acorn to explain his theory by showing that an acorn has a potential to become an oak tree. He points out that becoming an oak tree is the only prominent potential for an acorn because it cannot become anything else such as a human or a dog. Thus, according to Aristotle, attempts to become an oak tree (mixing with soil, pulling nutrients from the soil, soaking up water, etc.) will lead to happiness (Franklin, 2010).

When referring to humans, Aristotle points out that all humans have a potential just like the acorn, but that human potential can vary, while the acorn's potential cannot. Some may have the potential to be a mathematician, while others may be artists, scientists, dancers, etc. Aristotle points out that it is important for each individual to consider what type of endpoint is suitable and attempts to fulfill that accurate endpoint will cause happiness.

Aristotle believed that virtue, or the ability to determine which guiding principles to live by, was a tool for helping individuals reach their potential. Emotions and desire when used in conjunction with reason could aid fulfillment because desire and emotion provide motivation, while reason allows the individual to act in a constructive way. Implementing balance and moderation (what Aristotle called the golden mean) and giving back to strengthen one's communities were also tools which allowed one to reach his or her potential and experience happiness (Franklin, 2010).

Samuel Franklin. Samuel Franklin's book, *The Psychology of Happiness*, draws an important distinction about happiness, which is that happiness should not be equated to pleasure. He states, "Most people today think of happiness as a feeling, specifically, a feeling of pleasure," (Franklin, 2010, p. 2). He describes how happiness is used colloquially to refer to things that are enjoyed such as, "I am so happy to see you." Franklin asserts that the use of happiness in this context describes merely a feeling of pleasure, but not true lasting happiness. Similarly, things such as seeing a good movie, shopping, drugs, sex and music lead to feelings of pleasure, but that none of these experiences will cause enduring happiness.

Instead, Franklin adopts a view of happiness inspired by Aristotle because he views happiness as fulfilling potential as well. However, he uses Aristotle's theory to exhibit the fact that enduring happiness is a skill one must develop rather than an experience of a feeling.

John Kekes. Another modern philosopher, John Kekes, defined happiness as having two components. The first is an attitude and the other is an amalgam of "episodes

contributing to forming the attitude,” (Kekes, 1982, p. 358). The episodes are a positive reflection of personal actions and the attitude is a sense of fulfillment with regards to one’s entire life. Thus Kekes acknowledges that happiness results from specific events and the overall experience of life. He draws a distinction between the two by claiming that the attitude is not only comprised of a series of successful actions, but rather a consistent attitude of the entire process of one’s life as a singular entity.

Kekes continues to define the relationship between the two components by asserting that to achieve happiness and individual *must* have both. For example, one may have a goal and be solely focused on that goal. Achieving that goal will bring that individual happiness, but if he or she loses sight of everything else, the goal will not lead to enduring happiness (Kekes, 1982). A man who seeks to make a lot of money will certainly gain satisfaction when he acquires a high income, but it may not last. However, the man who seeks a large income to support his loved ones and give back to projects he has been working on, has a goal that relates to other aspects of his life; this man will feel a greater sense of fulfillment when he accomplishes his goal.

The Biology of Happiness

Stephen Klein. Stephen Klein is a psychologist who wrote the book *The Science of Happiness* (2006). A noteworthy point from Klein’s book is the relationship between the body and happiness. He explains that a smile is not the only bodily indicator of happiness. When experiencing joy, heart rate is increased by three to five heartbeats resulting in a slight increase in skin temperature, certain muscles relaxing, hormonal changes and much more. Most of these changes are unnoticeable, but have been

scientifically measured. Thus, Klein asserts that happiness stems from the body and the brain communicating in reaction to events or cognitions. He states, “Without our bodies, we would be incapable of happiness,” (Klein, 2006, p. 11).

Paul Ekman. Paul Ekman continues this discussion of bodily relations to happiness by exploring universal emotions and smiling in particular. Ekman discovered that emotions are innate rather than learned by studying the facial expressions of a tribe completely removed from society in Papua New Guinea (Keltner, Ekman, Gonzaga, & Beer, 2003). Tribe exhibited the expected facial expressions for fear, sadness, anger, and happiness. For example, when asked how they would feel when seeing their newborn child, members of the tribe responded by raising the corners of their mouth, lifting their cheek bones, and slightly scrunching the corners of their eyes, otherwise known as a smile.

Ekman was intrigued by this and further studied smiling. He created an elaborate numbering system to describe different sets of muscle movements, which comprise a smile. He discovered that there are nineteen different smiles, and only one type is genuine. Types of ingenuine smiles may include the smile to hide insecurities or the smile when giving a speech. A genuine smile however is involuntary and is comprised of the corners of the mouth rising, cheek bones lifting, and specific muscle movements around the eye area, which is called the orbicularis oculi (Klein, 2002).

This discovery of an involuntary genuine smile complicates the relationship between happiness and biology. Does true happiness overcome an individual and cause these particular bodily reactions? Or do many things have the potential to cause genuine

happiness, and the body decides which stimuli result in happiness? Another question would be the mediating role of cognitions. Can cognitions affect biology, so that certain stimulus incites bodily changes resulting in happiness?

Psychology

Subjective well-being (SWB) is the operationalized definition of happiness that psychologists use because it leads to accurate research. For the purpose of this paper, happiness and subjective well-being will be used interchangeably. The two terms provide the same meaning colloquially, so delving into the nuances scientifically speaking, confuses the larger point of how happiness relates to personality.

Michael Argyle. Michael Argyle is one of the leading psychologists on happiness. He was a social psychologist at Oxford University where he published 44 books and 170 studies (Colman, 2006). In his book called *The Psychology of Happiness*, he identifies three elements of happiness: different types of satisfaction, joy, and an absence of negative emotions such as depression, anxiety and general psychological distress.

Argyle also makes the point that happiness is not the opposite of unhappiness, but rather that they are independent. One cannot be happy and unhappy at the same time. He points to studies on positive and negative affect, which indicate that the positive affect and negative affect scales are independent of each other. Argyle claims that the *frequencies* or amount of positive and negative affect are inversely related, but that the *intensities* of either positive or negative moods are positively related (Argyle, 1987). This means that for individuals who have the ability to experience intense joy, they also

experience intense sorrow. Conversely, an individual who experiences minimal intensity of positive emotions will also experience minimal intensity of sorrow. This follows normal logic because individuals who are very expressive exhibit feeling intense emotions, while those who are more reserved rarely show outbursts of extreme emotions.

Argyle suggests that the element of satisfaction includes satisfaction with one's life in general and satisfaction with different domains of one's life (Argyle, 1987). Examples of domains include work, family, friends, hobbies, and finances. Combining an individual's overall satisfaction score and the satisfaction score in his or her two most important domains produces an accurate satisfaction score for that individual. Argyle suggests that important domains will vary across individuals, so it is best to simply ask the individual which aspects of life are most important.

The second dimension of happiness for Argyle is the frequency of positive emotions such as elation or joy (Argyle, 1987). For one to be happy, one must also be joyous. While these emotions can result from single incidences, Argyle maintains that for true happiness, these emotions must be a staple of that person's demeanor. Thus a high level of frequent positive emotions is the second element of happiness.

The last dimension Argyle attributes to happiness is a lower level of psychological distress (Argyle, 1987). He defines psychological distress to include negative emotions, which encompass feelings of depression, anxiety, boredom, worry, and physical symptoms of these emotions such as headaches or sleep deprivation. While acknowledging that psychological distress is related to all of these negative emotions, he chooses depression and anxiety as the two most related to happiness. Studies have also

shown a correlation between these two emotions (Argyle, 1987; Eysenck, 1976; Goldberg, 1972), indicating that these two emotions occur simultaneously for psychologically distressed individuals. Argyle shows that there is a negative correlation between psychological distress and happiness, so to obtain happiness one must have a lower frequency of negative emotions leading to a lower level of psychological distress.

Another factor of happiness for Argyle is health, although he acknowledges that health is related to the other elements of happiness both as a result and a catalyst. For example, good health may cause an individual to experience positive emotions, while dissatisfaction with health can cause negative emotions. Lastly, poor health such as exhaustion and slight headaches can be a result of negative emotions such as depression.

Measuring Happiness

Argyle is also revolutionary in the field of happiness because he invented the Oxford Happiness Inventory, which is commonly used to measure happiness in psychological studies. The Oxford Happiness Inventory has been shown to provide consistent results between different studies and across populations such as Australia, Canada, the United Kingdom, the United States of America, and Spain (Francis et al., 1998; Hills & Argyle, 2002). It has also been adapted to different languages in Israel and China (Hills & Argyle, 2002).

Questions on the Oxford Happiness Inventory and the adapted shortened version (Oxford Happiness Questionnaire) include questions such as “I don’t feel particularly pleased with the way I am,” “I am always committed and involved,” “Life is good,” “I am very happy,” “I am intensely interested in other people,” (Hills & Argyle, 2002).

Answers range on a 6 point scale from strongly disagree to strongly agree. On the abbreviated Oxford Happiness Questionnaire there are 29 questions total. Some of the questions are reverse scored and an individual ends up with a total score. Higher scores correspond to higher levels of happiness.

Since Argyle, many other happiness measurement scales have been invented. Such measures include the 4-item Subjective Happiness Scale, the 5-item Satisfaction with Life scale, the 18- item Well-being Scale and many more. What all these scales attempt to do is operationalize the word happiness into something that can be measured by psychologists to further understand the origins and intricacies of happiness.

Conclusion

Happiness is a topic of interest for different academic fields. Many have theorized and studied the idea of happiness and certain conclusions can be drawn from the current work on happiness. The first is that momentary happiness can be equated to joy and is different than enduring happiness. Enduring happiness is the type of happiness of interest and seems to be a combination of actions that lead one to fulfill his or her potentials. This leads to higher levels of satisfaction. Both positive and negative emotions contribute to enduring happiness, particularly high levels of positive emotions and low levels of negative emotions. Happiness has also been related to the body through changes of function and universal expressions of emotion. Within psychology, happiness has been operationalized as subjective well-being and has been the topic of many studies which measure happiness through various self-report measures. This method has been shown to have validity, which makes this a reliable way to describe a person's level of happiness.

This understanding of personality and happiness allows the freedom to explore personality's relation to biology.

Chapter 4

Biology of Personality

The debate of whether or not personality is biologically or environmentally determined is a prominent question in the field of personality psychology. Most early theorists believed that environmental factors such as parenting, birth order, or fulfilling comforts were the largest determinants of personality (Ryckman, 2013). With recent advances in technology, it is now possible to study neurological, genetic and physiological indicators of personality. This chapter will explore biological factors of personality not to conclude the debate, but to show the high possibility that parts of personality are biologically determined.

Genetics

Some studies have explored genetics as a possible explanation for personality. One study found that a mutated serotonin transporter gene with a short allele was responsible for increased activation of the amygdala when responding to negative stimuli (Heils, et al., 1996). This behavior is exhibited by individuals who experience anxiety and neuroticism (Lesch et al., 1996). This finding provided evidence for the association of neuroticism to a certain gene, but also showed how gene variation can lead to differences in brain functioning.

Another study discovered that a variation to the dopamine related gene called DRD4 was correlated with extraversion and novelty seeking in healthy men and women (Golimbet et al., 2007). This finding is intriguing because dopamine is the neurotransmitter in the brain commonly associated with reward seeking and movement.

Sensitivity to reward has been correlated with extraversion across many neurological studies (Gray, 1970; Avila, 1994; 2001; Kennis, Rademaker, & Geuze, 2013). Perhaps this gene is the precursor to this tendency of extraverts.

Neuroscience

There are three main ideas in the field of the neuroscience of personality. The first, and most pervasive idea is the Affective Reactivity Hypothesis, which reflects the idea that extraverts and introverts may be more aware of and respond to either reward or punishment. The second idea is that the two different personality dimensions react differently to either positive or negative emotional stimuli. The last theory explores neurological differences of positive affect and negative affect, which are strongly related to either extraversion or introversion.

The Affective Reactivity Hypothesis. Jeffrey Gray, a seminal researcher, created the Affective Reactivity Hypothesis, which states that extraverts are more sensitive to reward and introverts are more sensitive to punishment. In terms of neurology this means that extraverts have a more sensitive Behavioral Activation System (BAS), the neural mechanism for responding to reward. Conversely, introverts have a more sensitive Behavioral Inhibition System (BIS), the opposing neural mechanism for responding to punishment (Canli, 2006; Gray, 1970). Since Gray brought this theory to the attention of personality psychologists, many studies have been done attempting to find evidence for Gray's theory. The consensus supports the theory that extraverts have a more sensitive BAS and introverts have a more sensitive BIS (Avila, 1994; 2001; Caseras, Avila, &

Torrubia, 2003; Erdle & Rushton, 2010; Kennis et al., 2013; Quilty, Deyoung, Oakman, & Bagby, 2014).

A sensitive BAS has been correlated with traits of extraversion. This includes behaviors such as increased action or approach to tasks (Avila, 1994; Avila, 2001; Quilty et al., 2014), self-esteem, positive affect (Erdle & Rushton, 2010), and sensitivity to positive emotional stimuli (Canli et al., 2001). Individuals who have a sensitive BAS tend to exhibit the qualities of enthusiasm, strength, excitation, sociability, and warmth (Kennis et al., 2013). Other actions commonly associated with extraverts such as novelty seeking and openness to experience have also been related to a sensitive BAS (Golimbet et al., 2007; Kennis et al., 2013). Because these behaviors are all common tendencies of extraverts, a sensitive BAS can be associated with extraversion. A thorough discussion of studies showing the relationship between extraversion and a sensitive BAS will be discussed in the next chapter on extraversion and subjective well-being.

Neurological structures that have been identified with the BAS include the ventral striatal network, a group of neuroanatomical structures in the brain located at the center, with projections to the frontal lobe (Kennis et al., 2013). The neuroanatomy of the BIS includes the orbital frontal cortex, the medial septal area, and the hippocampus (Gray, 1970). These areas cover the middle region and the frontal cortex region just behind the eyes. Thus, one can expect these respective areas to show more activation for either extraverts or introverts. However, other areas of the brain beyond either the BAS or the BIS have been correlated with each personality dimension.

Response to emotional stimuli. Studies exploring different response patterns of extraverts and introverts to emotional stimuli indicate different activation patterns of the Prefrontal Cortex (PFC). The PFC is an area of the brain located near the forehead and has two parts, the ventromedial or bottom portion and the dorsolateral, which is the top portion. Extraversion was correlated positively to activation of the ventral medial PFC when tasks involved positive stimuli. Introversion was positively correlated to activation of the dorsolateral of the PFC when negative stimuli were presented. In addition, neuroticism was related to activation of the entire PFC during the presentation of negative stimuli (Kennis et al., 2013).

Another study found different activation patterns of the anterior cingulate cortex (ACC), a brain region located in the medial anterior region of the brain. This area has projections to the amygdala, which is the emotional center of the brain (Aggleton, 1992). The ACC deals with specific aspects of emotion such as emotional awareness (Canli, 2006; Lane, 2000) and focus on emotional stimuli, particularly positive stimuli related to reward (Canli, 2004; Canli, 2006; Derryberry & Reed, 1994).

Canli et al. (2001) tested extraversion against ACC activation to explore the relationship between extraversion and emotional stimuli. After taking a personality questionnaire, participants viewed emotionally positive or negative stimuli, and the experimenters discovered that extraversion was correlated with positive stimuli, but not negative stimuli. This means that extraverted participants showed changes in ACC activation only to positive stimuli. Introverts showed the same changes in ACC activation, but only for negative stimuli. This suggests that different personality traits

predispose an individual to focus and react to a certain type of emotional stimuli, which also reflects the idea of extraverts being more attuned to reward (a positive stimuli) and introverts being more attuned to punishment (a negative stimuli).

Positive and negative affect. One study measured cerebral blood flow (CBF) in the ventral striatum and found that it was related to positive affect in extraverts (Hermes et al., 2011). Hermes et al. (2011) discovered that positive affect should be considered the core of extraversion because positive affect exhibited a mediating role between extraversion and CBF. Both extraversion and positive affect positively correlated with CBF of the ventral striatum, but when positive affect was removed, the relationship disappeared for extraversion. In other words, positive affect was correlated to CBF in the ventral striatum, but extraversion was not. This led Hermes et al. (2011) to suggest that positive affect may be the core of extraversion based on neuroanatomical evidence.

Another study sought to find different activation patterns for positive and negative affect, which contributes to the findings of the previous study. Lane et al. (1997) found that pleasant stimuli eliciting positive affect were related to activation of the head of the caudate nucleus, an area physically associated with the ventral striatum. They also found that negative affect resulting from negative stimuli related to activation of the left amygdala, hippocampus, parahippocampal gyrus, and bilateral occipito-temporal cortex (Lane et al., 1997). Thus, these findings point to different neuroanatomical structures that elicit either positive or negative affect. It is noteworthy that the ventral striatum is a part of the ventral striatal network, which is associated with the BAS. Furthermore, the hippocampus is also associated with the BIS. Thus the neurological evidence supports

theoretical ideas that the BAS is related to positive affect and the BIS is related to negative affect. Both types of affect are also strongly correlated with either extraversion or introversion, implying that extraverts are more likely to see positive aspects of a situation and introverts are not.

Conclusion

This review of neuroscience and genetics shows compounding evidence for biological differences associated with different personality types. Genetic studies showed that different genes have been related to either introversion or extraversion. The Affective Reactivity Hypothesis of Jeffrey Gray posed a theory that extraverts are sensitive to reward and introverts are sensitive to punishment, which has recently been supported by neurological studies. Furthermore, the neurological evidence for positive and negative affect provides support for the idea that positive and negative affect are separate and more closely tied to one personality dimension. In addition, positive affect is neurologically tied to the reward system, showing that extraverts are more susceptible to being optimistic. On the other hand, the activation patterns associated with introverts imply that introverts are more likely to be pessimistic.

With this neurological evidence, a conclusion can be drawn that parts of personality are related to biology. However, one cannot say that biology is the sole determinant of personality. Future studies are required to juxtapose the effects of environment and biology to see which has a larger effect or how the two factors work in conjunction with each other to create personality.

Chapter 5

Extraversion and Subjective Well-being

The direct, positive relationship between extraversion and subjective well-being is one of the most robust relationships within the field (Argyle, 1987; Argyle & Lu, 1990; Costa & McCrae, 1980; Lucas et al., 2008; Pavot, Diener, Fujita, 1990). Some have disaggregated the components of subjective well-being and found that the relationship exists for general subjective well-being and for specific moments (DeNeve & Cooper, 1998). Extraversion has even been shown to predict happiness over a ten-year period (Costa & McCrae, 1980).

Recent additions to the literature on this relationship explore mechanisms for *why* extraversion is related to higher subjective well-being. To explain this, researchers have attempted to find a core element of extraversion that explains *how* the relationship works. Some of the literature concludes that an extravert's tendency to be social accounts for the core of extraversion (Emmons & Diener, 1986a; McCrae & Costa, 1987). Other studies have shown that positive affect is the core element of extraversion (Hermes et al., 2011; Tellegen, 1985; Vitterso, 2001). Others posit that a more sensitive reward system is the core of extraversion (Oerlemans & Bakker, 2014; Pavot et al., 1990; Smillie, Cooper, Proitsi, Powell, & Pickering, 2010). However, others suggest that the core elements may work interactively to explain the relationship (Pavot et al., 1990). To explore the mechanism behind the extraversion and subjective well-being relationship, I will explain each core element and proceed to explain studies which have tested each element.

Sociability

Numerous studies have explored sociability, but the literature has lacked a clear conclusion (Oerlemans & Bakker, 2014). Early research found supporting evidence for sociability (Eaves, Eysenck & Martin, 1989; Emmons & Diener, 1986; McCrae & Costa, 1987), while more recent studies have not supported sociability (Lucas, et al., 2008; Pavot et al., 1990). However, Oerlemans and Baker (2014) posited that the empirical evidence supporting sociability is weak in general, implying that the literature may be leaning away from sociability as the main mechanism for the extraversion and subjective well-being relationship.

Positive Affect

As previously discussed, positive affect is a person's tendency to experience positive moods. This has been correlated with extraversion in psychological studies (Costa & McCrae 1980; Heady & Wearing, 1989; Lucas & Fujita, 2000) and neurological studies (Hermes et al., 2011; Tellegen, 1985; Vitterso, 2001). However, the literature is still inconclusive because there is debate over how positive affect relates to extraversion. Some posit that positive affect is a part of extraversion (Lischetzke & Eid, 2006). Others claim positive affect is the core element of extraversion (Vitterso, 2001), and others believe it is only correlated with extraversion (Costa & McCrae 1980). It is clear that positive affect is necessary for happiness, but how positive affect relates to extraversion is undetermined.

Reward System

As previously discussed, the Affective Reactivity Hypothesis proposes that extraverts experience higher subjective well-being because they are attuned to see the positive aspects of a situation, while introverts are more likely to see the negative aspects (Gray, 1981; Oerlemans & Bakker, 2014). The neurological networks accompanying this theory are the Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS). A sensitive BAS is believed to lead to optimism while a sensitive BIS leads to pessimism.

The nature of each core element implies that these factors may work interactively (Oerlemans & Bakker, 2014) because they are not mutually exclusive ideas. Positive affect and reward recognition have both been related to the BAS, showing that even if they manifest in different behaviors, they both stem from the same neurological circuit. Furthermore, seeing reward and positive elements of a social situation would make one enjoy social situations, leading to positive affect and higher sociability. Because of this intertwined nature, some studies have tested multiple core elements. I will first explain one study which explores how positive affect relates to extraversion. Then I will explain two studies which tested reward and sociability, but came to different conclusions.

Exploring the Core Elements of Extraversion

Positive affect. Costa and McCrae (1980) were among the first to provide correlational evidence for the extraversion and subjective well-being relationship. They administered self-report surveys over the course of three months to adult males, assessing them on personality, subjective well-being, positive affect and negative affect. Costa and

McCrae found a mutually exclusive relationship between positive affect and negative affect. Positive affect related to extraversion and negative affect did not, while negative affect related to introversion, but positive affect did not. Most importantly, they also found that differences of positive or negative affect could predict levels of happiness up to a ten-year period. High levels of positive affect correlated to higher levels of happiness. Similarly, high levels of negative affect correlated with low levels of happiness.

Heady and Wearing (1989) set out to replicate this study with a larger sample from a different country (Australia). Heady and Wearing (1989) successfully replicated the results of Costa and McCrae (1980), showing that the relationship between positive affect and extraversion exists across populations and cultures. Despite this finding, Heady and Wearing (1989) did not test positive affect against other potential core elements of extraversion, so it did not establish that positive affect alone accounts for the extraversion and subjective well-being relationship.

Reward system. Pavot et al. (1990) tested the Affective Reactivity Hypothesis and sociability to see which element of extraversion accounted for extraversion's relationship with happiness. They explored three possible explanations for the relationship. The first two dealt with sociability of extraverts. The third explanation was related to personal temperament differences, implying that an extravert's ability to see reward leads to happiness. Thus, the first two explanations tested the idea of sociability and the third tested the Affective Reactivity Hypothesis to include positive affect.

The first theory is that because extraverts have a higher frequency of social interaction, extraverts are happier. Emmons and Diener (1986a) found that frequency of social interaction was positively correlated with level of positive affect. This implies that positive affect is gained from social interactions. Thus, extraverts may be happier because they frequently participate in social interaction.

The second theory expands upon the first by saying that extraverts have a better way of approaching social situations. Modern society requires interaction with others for survival like networking to find a job and being an active member of any job. Therefore, while everyone must face these social interactions, extraverts are better equipped to deal with these everyday situations because they enjoy interacting with others. While the two theories of sociability are different, Pavot et al. (1990) hypothesized that the two theories may not be mutually exclusive when affecting the extraversion and subjective well-being relationship.

The third theory differs from the first two because it relates to individual differences rather than social participation. According to this theory, extraverts are happier because of their positive mindset, and their ability to see the good in situations regardless of social interaction. Evidence that extraverts experience more positive affect than introverts in both social and nonsocial situations would support this theory because sociability would not be a factor increasing positive affect.

To test these three hypotheses, Pavot et al. (1990) collected data from introverts and extraverts in social and nonsocial situations. They sought to establish the relationship between extraversion and subjective well-being by implementing different methods for

measuring personality and subjective well-being. They expanded upon the traditional format of only self-report questionnaires and also included personal inventories, peer reports, daily mood reports, momentary mood reports, and clinical interviews. With these extensive types of measuring, their data still showed a positive relationship between extraversion and subjective well-being, which not only further supported the relationship, but meaningfully substantiated it as well.

Once the relationship was established within their own data, they set out to determine which of the three theories most accurately accounted for the relationship. The first finding was that within the sample, extraverts did not report a higher frequency of social interaction than introverts, disproving frequency of social interaction as the mechanism leading to higher subjective well-being. However, this finding may have been limited due to the time frame of the data collection period, which was one academic semester. Perhaps if the study was longitudinal, extraverts may have reported higher frequency of social interaction than introverts. Thus, while the results of the Pavot et al. (1990) did not support the first theory of sociability, it cannot be ruled out completely either due to the time frame.

The second noteworthy evidence from this study was that extraverts and introverts experienced higher levels of positive affect from social interaction than from nonsocial situations. These results imply that both extraverts and introverts are happier amongst others than when they are alone. This does not support the societal theory, which posits that introverts receive less positive affect from social interaction, so societal demands for socializing would lead to lower levels of subjective well-being. To

summarize the first two findings, there was no evidence for a higher frequency of socializing among extraverts, or less positive affect among introverts in social situations. This means that both theories of sociability were not supported by this study.

Pavot et al. (1990) found evidence for the Affective Reactivity Hypothesis because they found that extraverts experienced higher average levels of positive affect than introverts in both social and nonsocial situations. In other words, extraverts in general experienced more positive moods than introverts, which could be due to a more active reward system, meaning that the extraverted temperament is most likely to see the good in a situation. As discussed before, the BAS allows one to be attuned to reward, so in neurological terms, these results imply a more sensitive BAS within extraverts. Strengthening the support for this third theory was the finding that introverted individuals also reported higher levels of negative affect for both social and nonsocial situations than extraverts. This implies a more sensitive BIS, predisposing introverts to seeing the negative aspects of a situation.

Collectively, the findings of this study supported the idea that the positive relationship between extraversion and subjective well-being is due to extraverts having a more sensitive reward system conducive to optimism. Furthermore, the results did not support sociability as a significant factor because neither frequency of social interaction or more enjoyment of social activity proved significant.

Reward system and sociability. Keeping in mind that the BAS is the core of the Affective Reactivity Hypothesis, Oerlemans and Bakker (2014) explored which types of situations led to higher levels of positive affect for extraverts. In particular they studied

pleasurable activities (e.g., watching a funny TV show) and rewarding activities (e.g., earning money). This idea stemmed from Oerlemans and Bakker's (2014) claim that the BAS is often misinterpreted as a "pleasure system," but due to current neurophysiological evidence, the BAS should only be considered a reward system (Kringelbach & Berridge, 2009; Treadway & Zald, 2011).

In addition to testing the BAS, Oerlemans and Bakker (2014) wanted to expand the inconclusive literature about sociability as a core element of extraversion. They claimed that the empirical evidence from studies supporting sociability was weak, but also hypothesized that sociability and the Affective Reactivity Hypothesis could work interactively rather than exclusively. Therefore, they tested sociability and reward simultaneously.

With this new concept of the BAS, and the inclusion of sociability, Oerlemans and Bakker (2014) explored four hypotheses. The first was that extraverts rather than introverts would experience more positive affect from rewarding situations rather than pleasurable situations. They found this pattern within their data, which confirmed their enhanced view of the BAS as a reward system rather than a pleasure system.

The second hypothesis addressed the relevance of sociability. It stated that extraverts would experience higher positive affect when performing activities (pleasurable or rewarding) in the presence of others rather than alone. Extraverts showed higher levels of positive affect when in the company of others, providing evidence supporting sociability.

The third hypothesis expanded upon the first two by stating that extraverts would experience more positive affect from rewarding situations when done in the company of others than when alone. The findings supported this hypothesis as well, which indicated evidence for the possibility of an interactive relationship between the Affective Reactivity Hypothesis (reward) and sociability.

Lastly, the fourth hypothesis stated that the amount of time spent on rewarding activities and the amount of time in social settings would mediate the relationship between extraversion and subjective well-being. They found that both time spent on rewarding activities and time spent in social settings positively related to extraversion, meaning that both elements contribute to the positive relationship between extraversion and subjective well-being.

Oerlemans and Bakker (2014) reported an additional finding that suggests that extraversion itself (without a core element) explains different levels of subjective well-being. They found that when they included mediators (rewarding situations and social vs. nonsocial situations), extraversion's ability to predict subjective well-being was only reduced by about 13%. Extraversion itself accounted for 87% of the direct relationship between extraversion and subjective well-being.

Conclusion

Between the three studies explored here, it is clear that the conversation of a core element of extraversion is inconclusive. Costa and McCrae (1980) established the positive relationship between positive affect and extraversion. However, they did not test whether positive affect *only* accounts for the more general positive relationship between

extraversion and subjective well-being. Thus, while the findings support positive affect as a potential core element of extraversion, it does not rule out other core elements as well.

Pavot et al. (1990) found support for a more sensitive reward system in extraverts accounting for the extraversion and subjective well-being relationship. Furthermore, Pavot et al. (1990) did not find support for sociability as a core element of extraversion. However, the results from Oerlemans and Bakker (2014) suggest that Pavot et al. (1990) did not find support for sociability because they tested for sociability and a reward system separately. Instead, Oerlemans and Bakker (2014) found evidence for sociability and a more sensitive BAS working interactively to account for extraversion's positive relationship to subjective well-being. Evidence for an interactive relationship reflects the intertwined nature of the three elements, suggesting that this advancement in the literature may be the most accurate.

The discovery that extraversion itself accounts for 87% of the extraversion and subjective well-being relationship (Oerlemans & Bakker, 2014) is new and intriguing. More research on this finding is necessary for further conclusion, but it does beg the question of whether extraversion has a core element responsible for the positive relationship between extraversion and subjective well-being.

In summary, the current empirical evidence provides no concrete answer as to *why* extraversion positively relates to happiness. The most accurate answer currently is that the core elements may all account for extraversion's ability to determine happiness. Finding a core element that accounts for this relationship is important to the pursuit of happiness because it shows qualities that allow one to be happy. Therefore, while the

qualities of sociability, positive affect, and reward more naturally relate to extraversion, they can still be adopted by introverts as a means of increasing happiness.

Chapter 6

Positive Illusions

Conclusions from chapters four and five show that personality is partially driven by biology, and that extraversion is more conducive to happiness. If this is the case, what should introverts do about obtaining happiness? Does the biological evidence imply that introverts can never be happy? If optimism and positive affect have been linked to extraversion, adopting a positive mindset in theory should help introverts obtain happiness. Thus, positive illusions may have the potential to increase introverts' chances of happiness. However, for this to be valid, there must be a positive relationship between positive illusions and subjective well-being.

Positive illusions has been defined as false beliefs about the self or events related to the self (Taylor, 1989). Positive illusions can be divided into three categories: illusions about the characteristics, quality, and abilities of one's self, illusions about control over important future life events, and an overly positive mindset toward the future (Young, 2014). Explaining theories founded in psychological data will provide suggestions for how therapy and active pursuit of changing one's mindset can use positive illusions as an aid for achieving happiness.

Self-Enhancement Bias

The self-enhancement bias is the operationalized definition of the first category of positive illusions. The self-enhancement bias states that an individual is likely to view himself or herself in an overly positive way to fulfill the desire to uphold a positive self image and to be viewed positively by others. Those who exhibit the self-enhancement

bias tend to view themselves as above average in terms of qualities and abilities (Alicke & Govorun, 2005; McCaslin, Petty, & Wegener, 2010). In addition, they tend to ignore negative attributes by diminishing their significance or relevance.

One study conducted by McCaslin et al. (2010) tested whether an individual would be motivated to change his or her behavior based on perceptions of accuracy or perceptions of self-enhancement. They conducted two experiments, with the first testing motivations for accuracy and the second experiment testing self-enhancement with the potential to compromise accuracy. The first experiment required participants to estimate the amount of dots that appear on a screen. Participants completed this task twice with the first time free of bias. After the completion, participants were told that they either overestimated or underestimated the amount of dots. This introduced a bias perception of self accuracy before participants completed the second trial. McCaslin et al. (2010) hypothesized that individuals would estimate more dots if they had been told they were underestimators, and individuals who believed they were overestimators would estimate fewer dots. The results confirmed this hypothesis, which showed that individuals change their behavior based on a desire to be accurate. Interestingly, all participants were accurate on their estimation of the amount of dots before the bias was introduced, which indicates that a perception of accuracy rather than actual evidence of accuracy can motivate individuals.

The second experiment proceeded exactly as the first, but when individuals were given their bias (overestimator vs. underestimator) they were also given a psychological conclusion about their bias. For example, those in the overestimation condition were told

that individuals who overestimate “tend to be better problem solvers, take better care of themselves, and get along better with others.” Those in the underestimator condition were told that individuals similar to them, “tend to be less-skilled problem solvers, have more health problems, and struggle more to make and maintain friendships.” Thus, a positive and a negative condition were created. The positive condition showed that an individual was already acting in such a way that was self-rewarding, while the negative condition showed an individual that they were acting in a way that was not self-rewarding.

The experimenters expected to see the individuals in the negative condition change their behavior to be more self-rewarding, while the individuals in the positive condition would see no need for change. The results confirmed this because individuals in the positive condition showed no change in their estimation of the number of dots. However, participants in the negative condition overestimated the dots to compensate for their initial behavior, showing change in a self-beneficial direction. This suggests that individuals can be motivated to change their behavior if it appears that the change will be self-serving. Conversely, if an individual does not see a benefit there will be no change of behavior. In addition, similar to the results of the first experiment, all participants were accurate on their first assessment of the dots. Once, again this indicates that subconsciously, participants chose to adopt behaviors that were self-enhancing instead of accurate.

This relates to positive illusions because if positive illusions contribute to well-being, viewing positive illusions as beneficial, may motivate adoption of positive illusion into one’s mindset. Therefore, alerting depressed patients that their unhappiness stems

from a negative mindset may result in a change of behavior that is beneficial such as adopting optimism. In addition, this idea is supported by the fact that individuals who believe their current actions are self-serving will not change their behavior. For depressed individuals who maintain that their negative mindset is more accurate and thus should not be changed, pointing out the benefits of adopting optimism may persuade depressed individuals to change their mindset.

One issue with this last idea is that in McCaslin et al.'s (2010) experiment individuals were not explicitly told that they would give up accuracy to achieve a more rewarding outcome. Thus, when given the conscious choice, some individuals may chose accuracy. However, while this study does not show concrete, explicit evidence for the tendency of individuals to choose self-enhancement over accuracy, it does show an underlying psychological tendency to do so. If this tendency is pervasive in humans, then it can be said that most individuals are predisposed to choosing self-enhancement over accuracy. More exploration of the impact of self-enhancement on subjective well-being will be discussed in a later section of this chapter.

Illusions of Control

The illusion of control was discovered by a psychologist named Ellen Langer. In her studies Langer found that participants' held false perceptions of how their actions affected outcomes (Langer, 1975). All participants attributed their own actions to causing events that were clearly up to chance, such as winning the lottery. In one experiment, participants either chose a lottery ticket or were given a ticket by the experimenter. Later participants were allowed to trade their ticket for a ticket which doubled their chances of

winning the lottery. Those who had control over choosing their ticket did not trade despite knowing that the exchange would increase their chances of winning.

Alloy and Abramson (1979) sought to replicate the results of Langer's (1975) study. They had participants push a button to make a green light flash. In a low reinforcement condition the light flashed 25% of the time and in a high reinforcement condition the light flashed 75% of the time. The experimenters also measured the participants' perception of their control. Those in the high condition believed that they controlled the light, while those in the low condition recognized the possibility that the light was due to chance.

The literature on the illusion of control suggests two explanations for the results of these studies. The first theory is a human desire to master one's environment because it leads to higher self-esteem. Within an environment events that are left up to chance are seemingly impossible to master. Thus, the illusion of control is the only means of feeling complete mastery over one's environment (Langer, 1975). In the case of Langer's research, participants may have chosen to hold on to their ticket because if their ticket won despite the experimenter's offer to trade, it would increase their self-esteem. Furthermore, trading the ticket would represent an acknowledgement that they failed when choosing a ticket. This could subconsciously be equated to failure, which would result in lower self-esteem. Thus, keeping the chosen ticket was a sign of self-confidence and could potentially increase self-esteem (Langer, 1975).

The second theory is that the illusion of control provides protection against the negative consequences of feeling a lack of control (Alloy & Abramson, 1979; Koenig,

Clements, & Alloy, 1992; Lefcourt, 1973; Yarritu, Matute, & Vadillo, 2014). Studies have shown that a sense of uncontrollability can have negative consequences for emotions and attitudes, resulting in a lack of motivation (Yarritu et al., 2014). Thus, the illusion of control is a pervasive human tendency which allows for higher subjective well-being because it boosts self-esteem and prevents psychological distress.

Future Optimism

The last component of positive illusions is optimism, which was first identified by Alfred Adler, showing again how early theorist effect the field today. Particularly, Adler's notion of optimism has been defined to include optimism about future events (Young, 2014). The idea of optimism is one that has received much exploration. Some studies have shown a connection with subjective well-being (Carver, Scheier, & Segerstrom, 2010; Chang, 1998; Pretzer & Walsh, 2002; Young, 2014), an inverse relationship to distress (Brydon, Walker, Wawrizyniak, Chart, & Steptoe, 2009; Chang, 1998; Jobin, Wrosch, & Scheier, 2013) and a relationship to personality types (Sharpe, Martin, & Roth, 2011). While other studies have looked at mechanisms for the desirability of future optimism (Lench, 2009), and the changes of optimism over time (Segerstrom, 2005; 2006). Lastly, some studies have attempted to further define the types of future events that people are optimistic about by dividing future events into those related to the self and those related to the world (McElwee & Brittain, 2009; Wengler & Rosen, 2000).

When referring to positive illusions, future events related to the self are the ones of interest rather than those related to the external world (McElwee & Brittain, 2009;

Young, 2014). This manifests in an individual having an overly positive view of the likelihood of desirable outcomes in his or her future. Such a mindset has been shown to help individuals face adversity (Carver et al., 2010), and to prevent against higher levels of psychological distress (Brydon, et al., 2009; Carver et al., 2010; Chang, 1998; Jobin et al., 2013). This negative relationship between optimism and stress has been shown with perceived stress and biological indicators of stress such as cortisol (Brydon et al., 2009). Other studies have pointed to these findings, and suggested that optimism's ability to decrease psychological distress has a direct positive effect on subjective well-being and happiness (Chang, 1998). Thus, it has been repeatedly shown in the literature that optimism has benefits equitable to the ideal outcomes for most individuals and especially those striving for happiness (Carver et al., 2010).

The question then becomes whether optimism is a characteristic that can be learned to help people achieve higher levels of happiness. Would telling someone to think more positively really increase one's happiness? A psychological tendency to change one's behavior if the change seems advantageous has already been shown through the discussion of the self-enhancement bias, so individuals may be motivated to incorporate optimism into their mindset, but would this mindset persist? Furthermore, is learned optimism equally effective as natural optimism?

The prevalence of cognitive therapy shows that adopting positive cognitions is not only possible, but effective for increasing subjective well-being and happiness. The fundamental idea behind cognitive therapy is that thoughts produce emotions and consequently behaviors (Carver et al., 2010). Hoffart and Sexton (2002) tested 35

patients with panic disorder to see if cognitive therapy that introduced optimism had an effect on negative cognitions, empathy, and distress. They found that optimism decreased negative cognition patterns, decreased stress, and increased empathy (Hoffart & Sexton, 2002). This study shows that optimism can be implemented through cognitive therapy and that the results of this learned optimism are effective in reducing negative cognitions and stress, which are depressive symptoms. Consequently, this shows that positive illusions when adopted can increase happiness.

Positive Illusions and Subjective Well-Being

From the research on each component of positive illusions, it is clear that each element contributes to subjective well-being. The self-enhancement bias showed a psychological tendency to choose actions that will benefit an individual even if it requires changing current actions. This indicates the possibility that an individual can be trained to adopt positive illusions to increase his or her well-being. The self-enhancement bias also indicated that individuals practice this aspect of positive illusions because it maintains and increases self-esteem, another factor that contributes to well-being.

The only outstanding question from the discussion on the self-enhancement bias is whether or not individuals would choose actions that are beneficial if they were aware that such actions would compromise accuracy. Studies of jury decisions have shown that individuals choose benefits over accuracy, if the outcome is desirable (McCaslin et al., 2010). An example of this would be when a jury ignores evidence that would result in an accurate conviction because the evidence was outside the realm of due process. Despite the psychological studies discussed before that did not present an explicit choice between

benefit and accuracy, the literature on jury decisions provides real-life situations where individuals chose benefit of another over accuracy. If human nature compels one to prioritize benefit of others over accuracy, one can reasonably assume that individuals would make the same choice for themselves.

The clear effect of the illusion of control on subjective well-being is its tendency to decrease psychological stress resulting from the feeling of uncontrollability. The illusion of control acts as a defense mechanism against this unwanted stress because it appears to individuals that they are controlling some aspect of their life even if their actions had no relation to the outcome. Certainly a downside of disappointment or shock is plausible, but still this disappointment is less psychologically stressful than feeling incapable of controlling any aspect of one's life.

Furthermore, the illusion of control is not exhibited in every setting. Thompson (1999) suggests that individuals only exhibit the illusion of control in situations regarding situational or personal factors. Situational factors are involvement, familiarity, additional knowledge, and reinforcement. Personal involvement means that the individual is directly affecting the outcome. For example, in the Langer (1975) study where individuals were given the choice to trade their lottery ticket, individuals who were personally involved (i.e., chose their ticket) exhibited the illusion of control and chose not to trade. However, participants who did not choose their ticket, decided to increase their chances by trading. This clearly shows that individuals will choose the illusion of control only in situations that directly involve their actions. Familiarity and extra knowledge about potential outcomes provides rationale for believing in personal potential in that particular situation.

Thus, an individual will not exhibit the illusion of control when he or she is not confident about the situation.

Lastly, reinforcement of one's success at a task will trigger the illusion of control. In the Alloy and Abramson (1979) study where participants judged their control over a flashing green light, those in the high reinforcement condition reported higher levels of personal control over the light. Repeated actions with positive results implies that the personal actions must be causing that visible outcomes, regardless of other factors.

Personality factors such as depression and the need for control can deter an individual from exhibiting the illusion of control. Those who are depressed tend to be less active, and thus have a lower chance of seeing positive results from their actions. This idea parallels the low reinforcement condition of the green light experiment. Furthermore, depressed individuals are more keen on seeing the negative outcomes (Gray, 1981; Oerlemans & Bakker, 2014; Thompson, 1999), so they may also be less likely to be reinforced even if they are active. This causes them to be more realistic in general about the amount of control they have over a situation.

Thus, it seems that the illusion of control is exhibited only in certain situations with certain personality characteristics (Alloy & Abramson, 1979; Langer, 1975; Thompson, 1999). Because the illusion of control has been correlated with higher subjective well-being in these cases (Kwan, Kuang, Zhao, 2008; Taylor, 1989; Yarritu et al., 2014), the illusion of control when used properly can have positive effects on well-being. Thus, with appropriate encouragement, this aspect of positive illusions can be used by therapists to help patients increase their happiness.

The third component of positive illusions has been shown to have a direct impact on psychological well-being because of its tendency to reduce stress and provide a framework for an individual to face adversity (Carver et al., 2010). With the robust and nearly conclusive literature on optimism, the only question is whether or not optimism can be learned, and whether that learned optimism produces the same effects for well-being. However, the pervasiveness of cognitive therapy and the Hoffart and Sexton (2002) study suggest that learned optimism through cognitive therapy can be effective. Further research is required to determine how effective learned optimism is, under what circumstances it is successful, and the mechanism for its effectiveness.

Conclusion

Positive illusions as a whole and as singular components contribute to well-being. However, the prevailing concern is still how to effectively employ positive illusions. Having an overly distorted self-perception will lead to arrogance and dislikability among peers, which will not increase well-being (Kwan et al., 2008). Overconfidence in one's ability to control a situation will lead to disappointment and shock (Thompson, 1999), and an overly optimistic attitude about the future will lead to disappointment and a sacrifice of reality (Carver et al., 2010; Shepperd, Sweeny, & Carroll, 2006). Thus, moderation is the healthy way to employ positive illusions. Because with moderation, positive illusions act to suppress negative emotions rather than becoming one's reality.

The possibility of employing positive illusions as a therapeutic technique should not be questioned. It has been shown that if one exhibits excessive positive illusions, he or she can change these false beliefs to a more accurate perception of reality through

therapy, which focuses on enhancing that individual's ability to detect the truth. This is done by pointing out ideas and tendencies that lead to false perceptions (Kruger & Dunning, 1999; McCaslin et al., 2010; Pronin & Kugler, 2007). If it is possible to tame one's positive illusions, it would be logical to assume that enhancing one's positive illusions would also be possible. Showing a patient that a mindset free of positive illusions does not accurately reflect the environment would result in a change of behavior. In addition, by pointing out the negative consequences of pessimism, self-deprecation, and victimization, one might be motivated to think more positively, which would in turn increase one's happiness. Therefore, those who are predisposed to being less happy because of biology or personality, can use positive illusions to help increase their happiness. The next chapter will explore Depressive Realism to provide a solution for how to moderate positive illusions, so they can be implemented to increase happiness.

Chapter 7

Depressive Realism

Depressive Realism is the idea that depressed people have a more accurate perception of reality than nondepressed people. As discussed with positive illusions, optimism adopted during the illusion of control forfeited accuracy. Because of this, there seems to be a choice between accuracy or optimism and potentially happiness. This chapter will establish that this choice is unnecessary because when optimism and accuracy are adopted together, the result is a moderate amount of positive illusions, conducive to happiness. Exploration of studies on Depressive Realism will show that inactivity rather than depression causes accuracy thus allowing happy people to also be realistic. The benefits of maintaining optimism and accuracy are relevant to this paper as a whole because it provides a means for individuals to increase personal happiness.

Studies on Depressive Realism show inconclusive results (Ackermann & DeRubeis, 1991). Some studies have found that depressed participants made more accurate assessments of ability and outcome (Golin, Terrel, & Johnson, 1977; Nelson & Craighead, 1977; Seligman, 1975). Other reviewers have found that depressed individuals are less optimistic, which contributes to their lower level of subjective well-being (Ruehlman, West, & Pasahow, 1985; Taylor & Brown, 1988). Some studies also found conflicted evidence, indicating that degree of depression affects the applicability of Depressive Realism (Soderstrom, Davalos, & Vazquez, 2011). The current evidence draws no single conclusion, but further exploration is important to understanding how accuracy can mediate the negative effects of excess positive illusions. Thus, in a

counterintuitive way, Depressive Realism can enable happiness but only if another factor besides depression is the cause of accuracy.

The first step in establishing this will be to explain methodological issues of measuring accuracy, common to paradigms that test Depressive Realism. This will show that the evidence supporting depression as the cause of realism has little validity. The second step will be to introduce another possible cause of higher levels of accuracy among the depressed. Lastly, a discussion of cognitive therapy will show how this new view of Depressive Realism can be implemented to help those searching for happiness.

Measuring Accuracy

A reliable measurement of accuracy in studies involving Depressive Realism guarantees the validity of the results. However, in some experimental paradigms commonly used to test Depressive Realism, the measurement of accuracy does not measure accuracy correctly (Ackermann & DeRubeis, 1991). Many reviews of Depressive Realism comment on various factors which affect measuring accuracy (Alloy & Abramson, 1988; Ruehlman et al., 1985; Taylor & Brown, 1988). The two that will be discussed in this chapter are skill-based tasks and self-reinforcement.

Skill-based tasks. The first type of study which uses a false measure accuracy is the skill-based paradigm. These types of studies are designed to test Depressive Realism by presenting participants with two tasks, one which appears chance-determined, and the other, which appears skill-determined. Both tasks are actually chance-determined. Because of this, an accurate participant would expect to give the correct answer 50% of the time.

Abramson, Garber, Edwards, and Seligman (1978) followed this model and tested participants on two tasks. The first was chance-based where the participant had to guess which slide would appear next on a projector while the experimenter visibly pressed a button to make the next slide appear. This allowed the participant to see that the experimenter was controlling the outcomes of slides. The skill-based task required participants to pull a string, which would raise a platform. The goal of the task was to keep a ball on top of the platform. The apparatus had a secret lever, which the experimenter used to secretly control the rate of success. Thus with both tasks the participant had no control over the outcome. Results indicated that depressed individuals exhibited expected success rates closer to 50% than nondepressed individuals, so it was reported that the findings supported Depressive Realism.

The human assumption that with practice comes improvement shows how this measurement of accuracy is unreliable, which deconstructs the validity of Abramson et al.'s (1978) conclusion. It is widely accepted that if one wants to improve skills, one must practice that skill to acquire aptitude. This assumption would be applicable to the skill-based task because as a participant continues through multiple trials, the participant is altering his or her strategy to succeed at the task. Higher expectations of success among nondepressed individuals then becomes an issue of confidence rather than accuracy. Depressed individuals exhibit a lack of confidence (Hermes et al., 2011; Uher, Payne, Pavlova, & Perlis, 2014), so it would follow that depressed individuals would show less expectancy of success than their nondepressed counterparts. Based off of the idea that with practice comes improvement, one might even conclude that the nondepressed

participants were more accurate because they considered their practice when making their assessment.

Regardless of what conclusion is drawn, one certain discovery is that the current conclusion cannot be upheld because the measurement of accuracy was not valid.

Therefore, this study and others using the same measurement of accuracy cannot support Depressive Realism.

Self-reinforcement. Other studies of Depressive Realism attempt to study the self-evaluation of depressed versus nondepressed individuals through tasks involving reinforcement. In these types of experiments there is one task that appears to be skill-determined, but is actually driven by chance. In the first half of trials, the experimenter provides a certain rate of reinforcement or punishment. In the second half of trials participants self-administer rates of reinforcement or punishment. The measurement of accuracy is the difference between the experimenter rate of feedback and the self-administered rate of feedback. This measurement of accuracy has been used in many other studies (Nelson & Craighead, 1977; Ruchman et al., 1985).

Nelson and Craighead (1977) studied depressed and nondepressed individuals using this method. Participants were presented with visual stimuli that were intentionally blurred so they would be visually ambiguous. Participants were told that the ambiguity was intentional resulting in no one correct answer, but the participant was required to categorize what they saw on the screen using their best guess. The experimenter would then provide feedback, which was based on the participant's condition. Thus, the task

appeared to be skill-oriented, but was actually dictated by random assignment to one condition.

The methodological error occurred before the second half of trials when the experimenter provided instructions for the self-administer portion of the experiment. Participants were specifically instructed to rate themselves without considering the experimenter's previous feedback. The experimenters gave these instructions so the experimenter feedback would not affect the self-administered feedback. Participants then proceeded to the second half of the trials and experimenters determined accuracy by the difference between the experimenter rate of feedback and the rate of self-feedback.

This measurement of accuracy is not valid for three reasons. The first reason is that participants were instructed to ignore the experimenter's feedback, so the discrepancy between the two ratings may have been a result of a participant's ability or willingness to follow instructions. Furthermore, no participant attempted to match the experimenter's feedback because of the instructions. The second issue of measurement relates to the nature of a skill-based task. As mentioned before, a participant may assume they are improving as the trials continue, resulting in a higher rate of reinforcement or a lower rate of punishment, which would cause a larger discrepancy between the experimenter ratings and self-ratings. Lastly, the nature of an ambiguous stimuli provides no correct answer for participants to determine their own accuracy. For these three reasons, this measurement of accuracy is flawed, and should not be considered as supportive of Depressive Realism. The same can be said for other studies which use this paradigm.

Mediators: Activity Level

Another issue in the Depressive Realism literature is the discussion of various mediating factors between depression and reality. Other mediator variables relate to aspects about the outcome a participant is predicting. Such aspects include emotional involvement with the outcome (Aeschleman, Rosen, & William, 2002) familiarity with the outcome and perceived likelihood of the outcome (Alloy & Abramson, 1979). Other studies have found that Depressive Realism depends on the level of depression, showing that only individuals who are severely depressed exhibit a realistic perception (Soderstrom et al., 2011). However, a frequently studied mediator which poses the greatest threat to Depressive Realism is activity level of the participant (Blanco, Matute, & Vadillo, 2009; Blanco, Matute, & Vadillo, 2012).

Blanco et al. (2012) conducted two studies to test the effect of activity level on Depressive Realism. In the first experiment participants completed a computer simulated task. A flash would appear on the screen and participants had to make the flash reappear by pressing the spacebar immediately. Black screen intervals between flashes lasted for either one or five seconds. Participants were told that a one second interval indicated success, while a five second interval indicated failure. Therefore, feedback seemed due to participant actions, but was preprogrammed. Measurements were taken of depression using the Beck Depression Inventory, perceptions of accuracy were recorded after the trials, and level of activity was logged by the computer. The experimenters found that participants with higher levels of depression showed less levels of confidence in their amount of control, but also responded less frequently.

In the second experiment the same computer task was given, but instead of dividing participants by depression scores, participants were randomly divided into two groups and given different instructions (Blanco et al., 2012). One group was instructed to press the spacebar as frequently as possible, while the other group was instructed to press the spacebar only 50% of the time. Depression scores were also measured for statistical purposes, but were not used to determine the two groups. As in the first experiment, participants were given a questionnaire to assess their perception of control of the outcomes in the task.

Results indicated that activity level had a direct effect on judgments of control when depressive symptoms were controlled for (Blanco et al., 2012). Those who were in the high frequency group perceived that they had more control than those in the 50% response rate group. This finding contradicts Depressive Realism. Furthermore, depressive symptoms had no effect on judgments of control when it was considered without response rates. This led the authors to conclude that the main cause of realism is a lower level of activity rather than depressive symptoms.

While depression is commonly associated with inactivity, Blanco et al. (2012) noted that many factors can cause an individual to be less active including instructions for a task, exhaustion, or lack of motivation in addition to many others. Thus, depression may not be the cause of a more realistic mindset, but rather it is associated with inactivity, which is the more accurate cause of a realistic mindset.

Furthermore, inactivity can lead to depression, which makes it less likely to cause a more realistic mindset. If a goal is heavily desired and many attempts are made, the

chances that the goal will be acquired is higher because with each trial the individual is either gaining skills or discontinuing strategies that will not lead to success. The inactive individual, however, has fewer chances to gain skills and strategies, and consequently if the few trials do not lead to success, perhaps, he or she will feel inadequate. Failure has negative psychological impacts on well-being and motivation (Stoeber, Schneider, Hussain, & Mathews, 2014), which could lead to depressive symptoms as well as further inactivity. Thus, the cycle of inactivity, depression, and reality is perpetuated and because inactivity has the potential to cause depressive symptoms, depression cannot be the sole determinant of a more realistic perception.

Cognitive Therapy

As discussed before, cognitive therapy focuses on changing the cognitions of patients. Cognitive therapy has been shown to be successful with alleviating cognitive symptoms (i.e., worry, anxiety) and vegetative symptoms (i.e., weight-loss, lethargy) of depression (Bhar et al., 2008). Cognitive therapy's approach to solving worry in depressed patients has two parts that a therapist uses simultaneously. The first is to encourage a generalized decrease of the patient's tendency to worrying. The second is to decrease any positive beliefs the patient may hold about the benefits of worrying. An example of this would be the idea that worrying allows the patient to consider all aspects of a situation and in turn make better decisions for themselves (Newby, Williams, & Andrews, 2014). Furthermore, some studies have shown that only targeting these positive beliefs about worry reduces a patient's tendency to worry (Robinson et al., 2010).

The success of this dual approach in cognitive therapy has been shown to treat this one aspect of depression (Newby et al., 2014), implying that it relates to depression as a whole. This shows that for cognitive therapy to effectively treat depression it must encourage the reduction of depressive symptoms (by introducing optimism) and decrease any positive beliefs about the benefits of depression (a realistic mindset). Through this approach of pairing positive illusions with inactivity, the result is a moderate amount of optimism conducive to increasing happiness. In addition, this dual approach of cognitive therapy has been tied to neurological changes, showing a biological basis for the success of this approach (Clark & Beck, 2010).

Conclusion

By showing that most studies supporting Depressive Realism use unreliable scientific techniques, a clear conclusion can be drawn that these studies do not support Depressive Realism. Furthermore the existence of numerous studies exploring mediators of Depressive Realism shows that other causes besides depression are being explored. Lastly, close investigation of activity level shows that this mediator is a more accurate cause of a realistic mindset. This finding is helpful because it shows that healthy inactivity promotes realism, which can balance the potential distortion of positive illusions. This moderation is paramount for increasing and maintaining happiness. The only outstanding question is the definition of healthy inactivity.

Healthy inactivity can be defined as a decrease in goal-oriented activity and an increase in pleasurable activity. As noted in the happiness chapter, Samuel Franklin asserted that happiness should not be equated to pleasure because pleasure is momentary

happiness not enduring happiness. Enduring happiness is the fulfilment of potentials according to philosophers, scientists and psychologists, and achievement of goals is necessary for achieving potential. Thus, goal-oriented activity is crucial for obtaining enduring happiness. However, in a state of depression goal-oriented activity may not make an individual happier because a sense of failure is more likely due to the tendency of depressed individuals being attuned to punishment (Canli, 2006; Caseras et al., 2003; Erdle & Rushton, 2010; Gray, 1970; Kennis et al., 2013). Failure generally leads to disappointment and feelings of inadequacy (Stoeber et al., 2014), but in a state of depression the feelings of inadequacy may be overwhelming. Thus, during depression one should pursue pleasure-inducing activities to subdue negative emotions. Once an individual's levels of depression has been alleviated, incorporating goal-oriented activity will be less potentially harmful because attunement to punishment will have decreased. Simultaneously this will increase one's chances of success with goal-oriented activity, which can lead to fulfillment and enduring happiness.

In summary, because the empirical evidence supporting Depressive Realism lacks validity, it cannot be determined that depressed individuals have a more realistic perception of reality. However, the literature on mediators between depression and realism propose that lower levels of activity is the source of realism. Because an individual cannot be simultaneously depressed and happy, evidence supporting depression as the cause of realism would negate the possibility of realism moderating optimism. However, healthy inactivity such as a decrease in goal-oriented activity, can

provide realism to moderate optimism. This means that one can be both realistic and optimistic.

Chapter 8

Conclusions

A synthesis of information from this paper leads to the conclusion that personality has an effect on happiness such that extraverts more commonly are happier than introverts. Biological evidence indicates that genetics and neurology play a part in creating personality, however, it is possible that environmental factors affect the development of personality. Because of this, extraversion predisposes an individual to higher levels of well-being, but it is still possible for other personality types to achieve happiness.

Positive illusions consisting of the self-enhancement bias, illusions of control, and optimism about the future correlate with higher levels of well-being. Because of this, positive illusions have been successfully utilized by cognitive therapy, which aims at changing the thoughts of patients. However, one caution remains such that positive illusions should only be encouraged and adopted in moderation.

Through exploration of Depressive Realism, it was discovered that depression is not the cause of a more realistic perception of reality, but rather that inactivity has a direct effect on a realistic mindset. Thus, healthy inactivity such as a shift of focus from goal-oriented activity to pleasure-inducing activity should be paired with the encouragement of positive illusions. This will tame the potential distortion of reality, which accompanies excess positive illusions. In short, some are predisposed through personality to higher levels of happiness, but those experiencing little happiness can

increase their happiness by adopting optimism and participating in activities that bring them joy instead of fulfillment of goals.

Despite the compounding evidence in support of the the conclusion of this paper, there are two questions that remain. The first is a disbelief that extraverts are happier than introverts due to a few studies conducted specifically on introverts. The second is the validity of positive illusions as a means of fighting against one's biology. This chapter will discredit both of these arguments by showing that they support rather than contradict the conclusion that happiness can be achieved by anyone. Next sharing personal evidence will show how I have implemented positive illusions and healthy inactivity into my own life to increase and maintain my enduring happiness.

Happy Introverts

A study conducted by Hills and Argyle (2001) discovered evidence for happy introverts. The study consisted of questionnaires collecting information about personality dimensions, preference for solitude, self-esteem, empathy, optimism, and life regard, which indicate how fulfilled a participant felt because of his or her personal goals. These measurements were intended to disaggregate happiness into factors which fulfilled satisfaction with life for either extraverts or introverts. The findings indicated that satisfaction with life was a better prediction of happiness than extraversion. The happy introverts reported in this study were individuals who felt fulfilled and satisfied with their life. This conclusion is valid because fulfillment of potential resulting in satisfaction is one of the main definitions of happiness pointed out in Chapter 3. Thus, these findings suggest that satisfaction and fulfillment is a better indicator of happiness.

The discovery of happy introverts does not disprove the argument of this paper. The aim of this paper is not to show that only extraverts can be happy, but rather to provide solutions for increasing personal happiness by exploring personality and well-being. The conclusion that satisfaction and fulfillment predict happiness provides another guide for obtaining happiness. If life satisfaction is the best predictor of happiness, one must find activities which bring about positive affect and success, which will result in satisfaction and happiness.

Furthermore, Hills and Argyle (2001) do not accurately disprove extraversion as a cause of happiness. If life satisfaction is the best indicator of happiness, it is noteworthy that natural tendencies of extraversion are more conducive to life satisfaction than the tendencies of anxiety, nervousness, and shyness commonly associated with introversion (Eysenck, 1947). Extraverts tend to be active, friendly and socially-oriented. The inherent qualities of being active and friendly are conducive to obtaining many friendships, which allows an individual more social interactions. Thus, the qualities of extraverts by themselves are self-serving, which is conducive to satisfaction. An extravert isolated from society living completely alone, may report lower levels of happiness, but within normal contexts, the inherent nature of extraversion is conducive to satisfaction and happiness. Furthermore, the high frequency of negative affect commonly associated with introverts make the inherent qualities of introversion less susceptible to satisfaction.

This argument for satisfaction now becomes similar to the argument of personality dimensions. It is different only by the fact that satisfaction is possible for both personality dimensions whereas arguments evaluating the effects of personality

dimensions consider individuals to be either introverted or extraverted. However, the argument of this paper is not that only certain people can be happy and everyone else must experience misery, but rather that everyone has the ability to increase personal happiness. Therefore, Hills and Argyle (2001) exploring a mechanism between personality and happiness does not disprove the effects of personality on happiness, but rather provides another viable option for increasing well-being.

Epigenetics

The second refute to this conclusion is the ability of cognitions and conscious choices to override biology. If biology is a large determinant of personality, will environmental factors such as thoughts and choices be enough to achieve happiness? The answer to this question lies in the field of epigenetics, which is the field of neuroscience that studies how events change neurology (Dalton, Kolshus, & McLoughlin, 2014; Rudenko & Tsai, 2014).

Neural plasticity is the term used for the human brain's ability to change and adapt over time, and is the crux of epigenetics. Neural plasticity has been shown to regulate neural metabolism and maintain neural functioning and structures (Rudenko & Tsai, 2014). A lack of neural plasticity leads to mental health impairments relating to degeneration. One example of this is Parkinson's disease, which is a result of the degeneration of dopamine neurons in the substantia nigra (Doppler et al., 2014). Neural plasticity has also been shown to be the main mechanism that allows for learning and memory (Rudenko & Tsai, 2014). Thus, epigenetics is important for maintaining the health of the brain and also for daily cognitive tasks.

While these are all valid examples of epigenetics, they are still hidden from conscious perception. Therefore, perhaps the most potent example of epigenetics is PTSD because it results in apparent changes of observable behavior. The brains of veterans with PTSD before combat and after combat show significant differences in amygdala, prefrontal cortex, and hippocampal functioning (Sripada et al., 2011; Stevens et al., 2013; Thomaes et al., 2014). Therefore, this is an example of a life experience that can have direct and potentially lasting effects on brain chemistry. This example is an extreme case of epigenetics, but it is intended to fully illuminate the capability of neural plasticity and epigenetics.

If PTSD can have this extreme effect on neurology, it logically follows that it is possible for other experiences to change brain chemistry. Studies have shown that cognitive therapy results in changes of neural functioning. Some studies have shown the effects of cognitive therapy with panic disorder (Yang, Kircher, Straube, 2014), social anxiety disorder (Goldin et al., 2014), obsessive compulsive disorder (Olatunji et al., 2014), and many others including depression (Yoshimura et al., 2014). Thus, epigenetics as a result of cognitive therapy shows that changing cognitions can result in neurological changes. If thoughts can change neurology, positive illusions can change neurology, so one is more susceptible to experiencing happiness.

A summary of both refutes shows that Hills and Argyle (2001) enhanced this paper because it provided another means of obtaining happiness. The discussion of epigenetics showed that cognitions and conscious choice can override biology, so both outstanding concerns with the conclusion that everyone can be happy have been negated.

I now turn to my own experiences to provide anecdotal evidence for how I actively increased my own happiness by adopting optimism in moderation.

Personal Experience

Hapa is my ethnic identity which means anyone of part Asian descent (Fulbeck, n.d.). Specifically I am half Chinese and half English. However, culturally I identify as American. My mother immigrated to America when she was a child and my father was born as raised in America. Because of this, my parents had opposite ways of thinking for just about everything, which typically led to fighting. (For an explanation of the cultural differences see Nisbett & Masuda, 2003). My parents eventually ended up getting a divorce and there was a period in high school where my relationship with both of my parents suffered greatly.

During this period, I was also experiencing troubles with friends and I was bullied by a group of boys both in person and through social media. Because I was disappointed by people, I constantly felt sad, anxious isolated and lonely. I started to believe that all humans were inherently malicious and that I was the only person I could depend upon.

My parents were already worried about how their fighting was affecting me, so they put me in contact with a therapist named Linda. Linda was crucial to my eventual increase in happiness because she persuaded me to change my negative view of humanity. She did this by offering other solutions for the hurtful actions of others. For example, she gave me the idea that my parents fought because they stemmed from different cultures. This allowed me to view their fighting as cultural differences rather than a hatred between my parents.

Linda also helped me stray from my pessimism about humans by explaining that external factors can affect one's actions. For example, my home life was so chaotic, so others' may also have chaotic home environments. If friends acted rudely, perhaps they were upset because their parents had a fight that morning. Linda's suggestions portray how cognitive therapy works by offering logical alternative explanations to combat pessimism.

Linda's help eventually resulted in me obtaining a positive mindset. I no longer believed that I was worthy of disappointment, I could control how I felt about others' actions, and I became optimistic which stemmed from my new core belief that all humans are inherently good and circumstantial factors cause negative actions. I hold this belief to this day because I have found that the saddest periods of my life have been when I lost hope in this belief. I cannot be certain whether or not this belief is less accurate than my once held pessimistic view of humanity, but I am certain that my now positive mindset directly accounts for my happiness.

This change of mindset was an act of adopting positive illusions. I adopted the self enhancement bias because I began to view myself more positively. The illusion of control manifested in my thinking that I could control my emotions and how others affected me. Most importantly, optimism was achieved because I held a new view of humanity. Because of this, Linda's use of positive illusions in cognitive therapy helped increased happiness.

Talking with Linda coincided with my first heavy involvement with dance, an activity I would discover brought me great joy. During my first performances I had a

flow experience where at the end of the dance I felt like the audience's applause woke me up. I had no memory of what had occurred, no recollection of the music or moving with my partner. It was a shocking experience and the overwhelming sensation of joy was unforgettable. Dance is an example of healthy inactivity because it gave me the experience of joy rather than fulfillment. As mentioned before, healthy inactivity is defined by a decrease in goal-oriented activity and an increase in pleasure activity. Therefore, dance is an example of how increasing hobby activities can help decrease negative emotions while in a state of sadness.

An example of a decrease in goal-oriented activity stems from the downside of my optimism, which is the tendency to excuse blatantly bad actions. Because I believe that all humans are inherently good and that external factors cause poor actions, I remain optimistic that the poor actions will decrease in the future. This causes me to remain in friendships or situations that are injurious. At one point during college it seemed that all my relationships were harmful, which forced me to remove myself from my current relationships. Removing myself shows healthy inactivity because it was a goal of mine to keep these friendships and work tirelessly to do so. Rather than becoming sad about losing almost all of my friends, my inactivity allowed me to be realistic about how these relationships were not beneficial for me. This realization has led to a tendency to disengage from emotionally strenuous events and relationships. Because this is now a tendency of mine, it shows how long term inactivity can aid enduring happiness in some cases.

My actions of upholding optimism, continuing dancing and decreasing unbeneficial friendships are the manifestations of moderate positive illusions. This shows how all components must work together to increase happiness.

The empirical evidence and anecdotal evidence provided in this paper aim to provide a framework for those seeking happiness. The framework should act as a starting point because happiness is a personal journey that relies on the beliefs and perspectives of an individual. Maintaining a positive mindset requires constant conscientiousness and effective moderation must be learned over time. However, happiness can be achieved and the pursuit of happiness brings one closer to happiness than remaining in a victimized state of sadness.

My final hope is that this paper has eliminated any beliefs that biology or other predisposing factors prevent one from being happy. Happiness is similar to a skill because it requires focus, dedication, and consciousness to fulfill one's potential. Thus, those who feel they will never be happy are not accepting the challenge. Furthermore, I hope that any benefit to remaining depressed has been negated, and that this paper can now serve as a guide to those in pursuit of happiness.

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