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Personality Theory in the Information Age

Reengineering Freud

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### Abstract

It is nearly impossible to find a psychologist who has not taken a side on psychoanalytic theory; a few still believe in it, most have already decided against it. The current study examines Freud's theory of personality, and in particular the anatomy of the mind published in 1923, from the perspective of emerging information paradigms, such as reverse engineering and the computer metaphor. Using modern terminology, Freud's original concepts of consciousness, id, ego and superego are revisited, and a new computational prototype of personality is proposed.

There is no field of psychological study with a broader range of contradictory scientific theories than the study of personality. As Psychologists Larsen and Buss explain in their book on personality theory, that the study of personality is best characterized by the well-known story from India about the blind men and the elephant (2008). In the story, a number of blind men are attempting to describe an elephant; however, since they are blind and cannot see the whole animal, and each can only describe the part which is closest to them; they understandably arrive at diverse and seemingly contradictory conclusions of what an elephant might be. The metaphor is helpful in explaining the dramatic diversity of personality theory and the difficulty that psychologists encounter when trying to explain something that they cannot see. The use of this allegory is also useful in so far as it admits both the complexity of the human self, and the blindness of modern scientific inquiry.

The elephant of personality has been described over the years from diverse perspectives. By far, the most influential theory of personality was proposed by Sigmund Freud (1856-1939), at the beginning of the twentieth century. Psychoanalytic theory of personality describes the human mind as a structural component of the self (Freud, 1933). As behaviorism came to dominate American psychology for most of the 1900's, personality theories focused on the enumeration and quantification of behaviors and traits, such as extraversion, neuroticism, conscientiousness, openness and agreeableness; the so-called big five personality traits (Fisk, 1949). With the discovery of the human genome, the importance of heritability began to take center-stage in personality research. The study of identical twins that were raised apart helped psychologists to identify the facets of personality that are genetically imprinted. Also advances in biology allowed researchers to broaden the understanding of behavior as a complex set of genetic and biological directives (Plomin et al, 1994; Eysenk, 1963). As the behaviorist fever began to

abate and the information age dawned, the focus of psychological research turned to cognition. This paradigm shift allowed personality theorists to begin to understand the mind as an information processor (Kelly, 1963).

Each of these theories of personality provides some limited insight into the complex world of the human self and are for the most part complementary perspectives. However, among the prominent theories of the last 100 years, there is only one that provides an actual blueprint of the structure of the mind, and that is psychoanalytic theory.

#### The anatomy of the mind

Freud's described the mind as *an energized psychic apparatus* (Freud, 1933, 1964) with a topology or geography that is laid out across three provinces: *The unconscious system* (UCS), which is the largest of the three; *the perceptual-conscious system* (PCPT-CS), which serves as a boundary with reality, and *the preconscious system* (PCS) which occupies a space between the UCS and the PCT-US.

The landscape of the mind is populated by three actors or sub-systems: the *id*, *ego*, and the *superego*. The *id*, according to Freud, is a raw sexual energy that occupies the dark recesses of the UCS. The *superego* arises from the *id* and becomes its moral counterbalance; the *superego* contains the rules of civilized behavior and can be conceived as the conscience. The tension created by the paradoxical forces of animal instinct and moral restraint result in the gradual evolution of the *ego*. Once developed, the *ego* attempts to mediate between the *id* and the *superego* based on its perception of reality. The exact geographical location of the *ego* and *superego* were not clearly defined by Freud, however he was inclined to believe that the

superego appeared to be active mostly in the UCS and PCS provinces while the ego spanned all three (UCS, PCS, and PCPT-CS). Fig. 1 (left side) shows the anatomy of the mind as proposed in lecture XXXI, published in 1933.

The anatomy of the mind, is just one part of psychoanalytical theory, other parts include psychosexual development, psychoanalysis, the study of everyday psychopathologies, and even a study of the mechanisms of humor. However, the present study focuses only on the structural components of the personality.

#### Counter-Freud claims

It is not unusual to hear psychologists say that Freud was wrong about one thing or another. Given the detail and scope of psychoanalytic theory, it should not be surprising that there is broad and deeply entrenched disagreement among personality psychologists, scientists, and the general public regarding its coherence, validity and scientific applicability.

Psychoanalytic theory has been attacked from all flanks; however, while the lines of attack by its many detractors are too numerous to list here; anti-Freud arguments can be summarized under two broad categories: bias and method.

The first argument against psychoanalytical theory is that Freud himself was biased. Psychologists and historians argue convincingly, that the theory is clearly male-centered and rooted in Freud's misogynistic perspective of life; critique that is blunted to some degree by the work of Anna Freud (1895-1982), Sigmund Freud's daughter and Karen Horney (1885-1952), a prominent follower of Freud who established the Electra complex as a counterbalance to the

Oedipus Complex. It is also argued by many, that the theory is overly pessimistic regarding human nature.

The second argument is based on method and is posited on two grounds. First, that the entire theory was built on flimsy grounds; essentially on interviews with a limited number of upper-class Victorian-age women and the exploration of Freud's own mind; and second, researchers argue that the theory lacks scientific validity because it cannot be empirically tested; some have gone as far as to claim that psychoanalytic theory is no more than a historical curiosity of very little scientific value (Kihlstrom, 2003).

All of these arguments seem valid and should be given careful consideration when attempting to judge, in scientific, moral, or social grounds, Freud's theory of personality. However, it should also be noted, that the arguments made against Freud are circumstantial at best; and at worst, appear to be attacks against Freud as a person. The fact, even if proven true, that Freud was a pessimist, male chauvinist who refused to accept the scientific method, has very little to do with the likelihood that his structural conception of the mind, was in fact, a relatively good description of personality or whether the anatomy of the mind he proposed was completely off-base.

Scientific discipline and fairness require that the validity of Freud's theory be evaluated on its own merits; apart from the particular bias of activists, researchers, and scientists; who may like or dislike the person on an assortment of individual grounds. In other words, it is the message that should be criticized, and not the messenger.

## Theoretical Models

One way to properly assess psychodynamic theory is to try to understand the difference between *a theoretical model* and *a scientific theory*. Theoretical models are conceptual constructs that help scientists to discover the hidden design of complex, integrated systems; models establish likely relationships among components working as a whole and suggest how these components might work together to produce a specific result. Scientific theories, on the other hand are abstractions based on empirical observations aimed at establishing causal connections between objects that can be tested and replicated. In simpler terms, theoretical models establish how a system is likely to work as a unit if a certain result is expected; while scientific theories, through repeated hypothesis testing, attempt to establish the causal connections between two or more isolated parts.

Once this distinction is understood, then it becomes apparent that Freud's anatomy of the mind is a theoretical model and not a scientific theory, hence the inability of scientists to test it using the scientific method; a model that is strikingly similar to the basic design of modern computers. This is truly remarkable, when it is considered that computers would not come into existence until more than a century later (Ceruzzi, 2003).

In fact, computational models in psychology did not emerge until the 1950's; primarily through the work of George A. Miller, most famously remembered for his work on memory encapsulation (Miller, 1956), and the use of *the computer metaphor*, which will be explored next.

## The Computer Metaphor

Since the 1950's, cognitive psychology has been closely tied to the so-called *computer metaphor*; a method of describing psychic activity by way of analogies with computational processes and terminology. The influence of the computer metaphor is not limited to psychology; indeed its impact on all spheres of science is so pervasive, that today, it is nearly impossible to find a scientific publication that does not use the computer metaphor to make some point regarding biological mechanisms, memory, cognition, or behavior. Computational terms such as short-term storage, top-down processing, and heuristics are just some examples of analogies that are widespread in all areas of scientific literature.

However, despite its universal presence in science, the computer metaphor has not been immune from criticism, particularly from the field of philosophy of mind (Cela-Conde and Marti, 1997); but also from cognitive psychology (Robinson, 1995).

The primary argument against the computer metaphor is from reductionism. It is argued that the complexity of the human mind is impossible to be reduced to a few simplistic computational terms. It is in essence the antithesis of Occam's Razor (Domingos, 1999), which contends that in fact, less is better than more when explaining complexity. Moreover, many cognitive psychologists, disillusioned with the inability of computer science to produce credible machine representations of artificial intelligence have joined the chorus against the use of the computer metaphor. Thus, after the initial euphoria of the 1950's, interest in computer modeling of the mind has waned, in favor of statistical analysis and measurements, and models based on mathematical data.

The relevance of theoretical modeling in research outside of psychology and philosophy has not diminished however, as technology has advanced and the understanding of computational design has become more ubiquitous, there has been a rebirth of the computer metaphor in the context of reengineering (also called reverse-engineering); an information age methodology widely utilized in business and industry. A famous instance of reverse-engineering occurred in the 1980's when scientists from Phoenix Technologies Ltd. were able to produce a clean copy of IBM's proprietary computer Basic I/O System Chip (Singh and Gupta, 2009). Using reengineering, complex, proprietary systems can be methodically decompiled and remodeled into workable prototypes. The model of personality which will be proposed shortly is based on this new interpretation of the computer metaphor.

Freud's model, reengineered

The process utilized by Freud, nearly 100 years ago was very similar to the way systems are reverse-engineered today. Based on observable output, i.e. hysteria symptoms, Freud attempted to decompile the mental apparatus so as to establish its basic components. Once the main parts were defined, Freud established their probable layout. From the likely design of the mind, he was able to infer the possible mechanisms of repression, thought, and mental maturation that make up his larger theory.

A lot has changed since the times of Freud. Today there is a much better understanding of the biological and psychological mechanisms that together make up the mind apparatus. There is growing consensus that brain activity is modularized in function, for example the limbic system appears to be the control center of reproductive and survival responses, i.e. the domain of the id (Vedhara and Irwin, 2005). Control of instinctual impulses has been narrowed to the frontal

cortex (Ochsner and Gross, 2005); damage to this area of the brain often results in lessening of inhibition; instinctual inhibition being the stated domain of the superego.

Advances in neurology (Cappaccio, 2010) have made it increasingly clear that biological and psychological command and control is exerted via largely autonomic functions of the peripheral nervous system; namely, aside from volitional motor control, most of the body is managed via back-end processes that are independent of the conscious mind; these autonomic processes are analogous to Freud’s UCS.

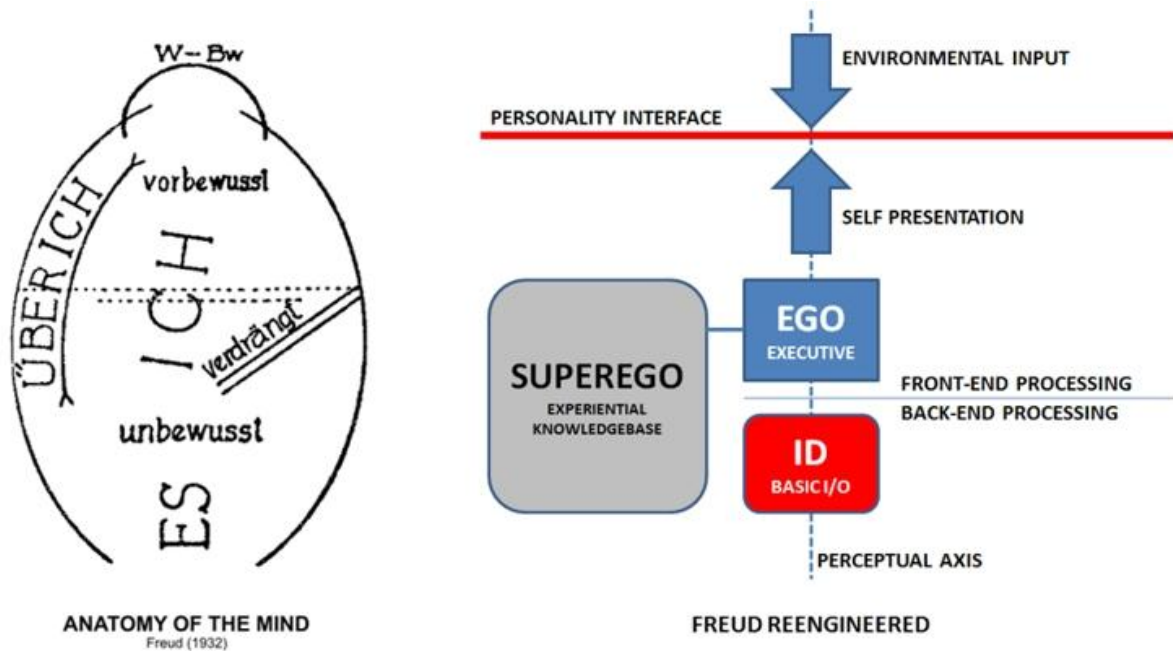


Figure 1 – Adapted from Freud’s original model of personality (1932)

Based the original dissection of the mind proposed by Freud in 1932, the model can be described in modern terms as a computational system that is composed of a front-end processor or executive (the ego), and a back-end basic input/output system (the id). There is also an

experiential database that is linked to the executive processor and provides a necessary check on the purely mechanical functions of the Basic I/O system; this database is analogous to the superego.

The output of the mind apparatus is the presentation of the self. The quality and accuracy of the self-presentation is constrained by the structural limits of the basic I/O system (primarily due to genetics and biology), the capacity of the executive (i.e. intelligence), and the validity of the experiential knowledgebase (i.e. maturity). The aggregate output of the mind apparatus is the personality interface; which refers to the behavioral activities of the self at the borderline of reality; specifically, at the line of confluence between the individual and the environment.

## Conclusion

Regardless of what modern psychologists think of Sigmund Freud personally, it is abundantly clear that his model of mind remains a formidable force in psychology. His theory of personality has yet to be refuted, except in terms of the inability of scientists to subject it to the one-dimensional, causation-bound, requirements of the scientific method. This is so, despite of the well-established fact that difficulty in quantifying computational processes is not unique to psychology; it is a fact of life in information technology, where scientific discovery implies the understanding of hidden design rather than the replication and prediction of observable events.

There were no computers during Freud's lifetime, yet his model is remarkably computer-like. This alone should encourage psychology theorists and researchers, especially those who have embraced technology, to take a new look at psychodynamic theory from the vantage point of 21<sup>st</sup> century Informatics. From a model such as the one established here, a plethora of testable

hypothesis can be derived regarding the functional relationships between the immune, neural and endocrine systems under the control of the limbic processor. Also, new avenues of inquiry could be established regarding the formation of trauma, experiential content, and biological memory; to name just two promising scientific venues. It is hoped that this study will serve as a guide for looking at difficult-to-solve scientific problems from a fresh point of view, and that it will encourage others to think outside of the box.

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