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UDK 159.9.07

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WHY WE MUST HAVE A "SCIENTIFIC PSYCHOLOGY" HOW DO WE "COME TO KNOW" WHAT WE TAKE AS OUR KNOWLEDGE?

Abstract: *It is argued here that all knowledge and Psychology especially needs to be scientifically based to avoid the biases of more personal opinions about behavior. Examples of conclusions about child development, empathy, helping, memory, psychopathology and individual differences are discussed to support the use of good science vs. personal opinion on creating knowledge about behavior.*

One general analysis suggests that we have FOUR ways of knowing:

This perspective goes in part all the way back to Aristotle, but it was more recently elaborated by Kerlinger (1973) in a beautiful book, *Foundations of Behavioral Research*. This volume was used at many graduate schools in the U.S. well into the 1980's, and I had the pleasure of meeting Professor Kerlinger in Amsterdam in 1976 and enjoying a wonderful evening in his home there ….Kerlinger also did the early programming for factor analysis that became that section of the SPSS application. He outlined for sources of knowledge:

Authority….we accept beliefs because authority figures like our parents or other high status persons assert "it is so." The problem here is that such knowledge is subject to errors held by those authority figures and when authority figures change….we might have new "beliefs" imposed on us.

Intuition…..some of our beliefs are held just because they "feel right to us." Religious beliefs usually fall in this category, as do some of our beliefs about others around us, e.g. "strangers are dangerous" as a belief helps us cope with, by avoidance, meeting new people. The Earth is the center of the universe" as a belief makes us feel good and seems like it should be true.

Tenacity…..some of our assumed knowledge is held to be true because …"it has always been true in our experience." Man was not meant to fly, since there are have never been flying machines was a common belief before 1903; women were not meant to be political leaders since there were not many female politcal leaders before 1960 (other than female monarchs in England and a few other places).

And finally….

Science….Using this road to knowledge, we hold beliefs to be *tentative*, to be *evidence based*, to be *subject to change* based on new and more convincing evidence. Science as the path to knowledge is perhaps culture's most significant agent toward change in the last 600 years. It is not WHO holds or asserts a belief, but the actual evidence that supports one belief over another that is held to be most convincing.

Psychology As Science

Here let's address how PSYCHOLOGY has evolved from holding beliefs about human

nature based on authority, intuition, and tenacity and moved to using SCIENCE as the foundation of our understanding of human nature and the society around us.

Science does NOT need laboratory "controlled experiments" to be good science, as the beginnings of this knowledge revolution emerged from simply making good observations, generating some principles or generalities that MIGHT be true from those observations, and then testing, critiquing, and refining them over time.

The earliest beginnings of the "science of psychology" can be traced back to Socrates and Plato (circa 350 B.C.) who examined human motivation and appeared to actually study the range of personality. Socrates considered thinking or cognition the highest order of human experience and the lowest was our regression to primitive needs like food and sex. In Plato's *Republic*, the beginnings of a personality classification system was introduced, based on the observations of how people about him differed. These were thoughtful observations, but they were **not quite** science yet, as they were presented with the voice of authority and meant to be accepted and not…debated for further refinement.

Thales(circa 575 B.C.), another even earlier Greek philosopher, was almost more of a true "scientist" than the later Socrates and Plato, as he advocated "here is what we know NOW, it is up to you later to improve on this." This concept of critique and refinement is the core of Thomas Kuhn's (1996) concepts of "paradigms in science." This 20th Century argument develops deeply the idea that science is never certain, never final, never complete, but is always in the process of further refinement.

Goals of EVERY Science:

One of the common understandings of every science is that each shares a set of common goals, to describe, to understand, to predict, and to control the domain of their study. In Psychology we create observations that **describe** what we are studying, we produce **theories** that tie together those descriptions, and then we **predict** future observations/behavior given those theories, and finally we **control** behavior itself….or perhaps hope to?

Psychology could claim to be the oldest of all sciences, as imagine at the very dawn of human consciousness, when a family group in a cave somewhere at the edge of the Rift Valley saw another group of hominids coming into "their" valley and made a prediction of danger/enemy or safe/friend. That would have been an application of intuitive psychology and an example of predicting (human) behavior. **Modern science** uses common elements in every domain of application….

Some of these common tools/elements are:

Facts: specific belief that can be verified and confirmed consistently.

Concepts: more general ideas that help us categorize observations, and example of a concept in psychology would be "achievement motivation," or "intelligence."

Principles: relationships between facts or concepts, for example, parents with higher socioeconomic status have children with higher IQs.

Laws: absolutely established, consistently supported relationships, example a random interval reinforcement schedule will produce the most continued behavior.

Knowledge is **NEVER** held absolutely certain in a true science based scheme of understanding; beliefs MUST be open to revision and evolution.

In Psychology, some of our most esteemed ideas come from a combination of observational insight and intuition, for the work of Freud, Jung, and most of the early personality theorists used these methods to develop their insights. BUT these early "Psychology Scholars" were frequently more authoritarian in the presentation of their ideas and were not open to critique or rebuttal.

Freud is one of the most respected contributors to the early days of modern Psychology, but he was personally as authoritarian and dictatorial as anyone in the history of

ANY science. Freud had Adler thrown out of the Analytic Society for having the audacity to add to "his ideas on motivation," and further had Jung excommunicated for his deviationist thinking. Good science treats new ideas critically looking for data that supports one position or another, but does NOT simply close the door by ignoring and rejecting new ideas *fait accompli*.

Freud was then, a most inspired and creative observer of the human condition, BUT he was a terrible example of "good science."

On the plus side, Freud's daughter, Anna's (1968) final presentation of **defense mechanisms** has pretty much stood the "test of time" as being a very useful set of principles for psychology. Repression, denial, projection, displacement, regression, and sublimation are all very useful concepts even 140 years after their introduction to our discipline.

Maslow's (1943) work on the hierarchy of needs and self-actualization is another example of a concept that yield promise in our discipline, but which is based mostly on intuition. Many therapists like the concept and see it has great promise in some applications, but it is one that has little grounding in more standard experimental or data supported evidence.

Good Evidence. We have the common feeling that we can, at least usually, r**emember very well what we see**.

Our common legal system is strongly rooted in this belief, as eyewitness testimony is one of the most compelling elements in our judicial system. BUT what is the real data on the accuracy of such eyewitness reports? Elizabeth Loftus, an American Psychologist, has made her career through the study of the accuracy of such experience and reported memories. Loftus and Palmer (1974) showed that even the language used in eyewitness testimony can alter the memory of the critical event. Bartlett (1932) showed that memory is highly Reconstructive and later work by Charles Osgood (1952) presented a model of semantic memory that helped integrate early work on WHY long-term memory is so frequently distorted.

Psychological Insight: Memory is frequently not accurate, especially if there is any kind of strong emotional state attached to that memory. Long-term memory is not stored as an image or photo, but rather is strongly **coded** to how we semantically stored the original information and how it MIGHT have been modified by rephrasing later.

Good Behavior.

We like to believe that **we are mostly good samaritans**; we are open to helping others. But in the last couple of months, three young men from my home city of Sacramento have received international acclaim just because they took action and helped in the French train incident with the heavily armed gunman. These three young men physically took down the the gunman and potentially saved many from death on that rail car. IF this kind of "good behavior" was common, it would not have been cause for such international recognition. So, what do we really KNOW about our willingness to help others?

In New York City some 50 years ago there was a murder of a young woman, Kitty Genovese, that drew the attention of social psychologists John Darley and Bib Latane' (2005). The subsequent research led to the development of the concept "Bystander Effect." This concept suggests that the more witnesses to a crime or set of potential helpers, the LESS LIKELY is anyONE going to take action to actually help. This is also called the "diffusion of responsibility" hypothesis by some scholars.

In that original Kitty Genovese murder, the attack on Kitty went on for about two hours and as many as 38 possible witnesses/samaritans COULD have taken action to save this young woman from a brutal murder…..but none did. Sadly this lack of proactive involvement is more the rule in human behavior than the exception as in 2010 Hugo Alfredo Tale-Yax died

of stab wounds in New York City after trying to aid a woman attacked by a robber. Hugo lay bleeding to death on the sidewalk while passersby responded with stares and in one case taking pictures

but NONE called emergency services.

Psychological Insight: So, helping others is more of THE EXCEPTION than the rule in common human behavior. That confirms why we give special awards when we do find such examples of empathy and caring.

Good Versus Bad Situations

Another related common belief is that we "**have empathy for others**," but clearly in terms of the "Bystander Effect" or "diffusions of responsibility" constructs this seems not to be the case. But maybe in a one-on-one situation we would show this potential for compassion?

Phil Zimbardo, one of the most respected social psychologists of the late 20th Century, asked the question about how much of our regular daily behavior is driven by core personality systems that are common across situations OR whether our behavior would be more compliant to the roles of a given situation. In a now famous experiment, the Stanford Prison Experiment," Zimbardo (1973) set out to examine how much of our behavior would be powerfully shaped by the situational role we assumed. Zimbardo randomly assigned volunteer student subjects different roles in a mock prison he set up on the Stanford Campus: some students were the jailers and others the prisoners. Given these two roles and a realistic prison setting within a few days this study had to be terminated, as the jailers had become too abusive of the prisoners to ethically continue the situational roles. The conclusion from this research is that our behavior can be strongly controlled by the roles inherent in the situation, even if it extends to abuse of another human being.

Stanley Milgram's (1963) earlier research was, in part, the background for Zimbardo's work, as Milligram created a scenario where volunteer "teachers" in a human learning setting accepted the assigned situational role to increase shock levels to a range labeled….lethal on the teacher's control apparatus….even while hearing painful screams from the learner in the other room. Almost two-thirds of the adult community volunteer subjects in Milgrams obedience study took shock levels to that "killing" level.

And even earlier, Solomon Asch(1955) (born in Warsaw Poland) used a simple line judgement task with a group of stooge assistants and one real subject, asking "which line is longer." The real subject was the last to respond after all the complicit stooges had asserted the clearly incorrect answer, and the real subject showed compliance and most often "went with the crowd."

An interesting footnote to the Asch conformity study is that one of the "stooge subjects," those coached to give the wrong answer on the line length question was actually Bib Latane', who went on to do the later work on helping behavior.

Psychological Insight: The majority of people will tend to accept social situations to control their behavior, even if they ideally know that behavior to be…wrong and callous.

Sources of Psychopathology

One of the early "insights" into human behavior from our esteemed Sigmund Freud was the idea that **neuroses are inherited** or the outcome of some "psychoanalytic" experience. Freud was a great observer of human behavior, but consider the range of his clinical sample of "research subjects:" Freud in his significant writing and leadership career period worked almost if not totally with….only female subjects. The neuroses he observed and treated were of a very selective and perhaps….just perhaps, not really of a truly general nature?

The early American psychologist, John B. Watson and his graduate student Rosalie Raynor did a carefully recorded research experiment with a young male child, Little Albert

(1920) which demonstrated that neurotic behavior could be conditioned via classical conditioning. This demonstration strongly argued that Freud might have simply ignored one of the different ways that a neurosis might evolve….from unfortunate learning circumstances, and that "therapy" for some neuroses might involve the simple "extinction conditioning" of the response behavior.

Psychological Insight: Neuroses can be the result of varied forces; proper and effective treatment must be tailored to the original experience that triggered the neurosis.

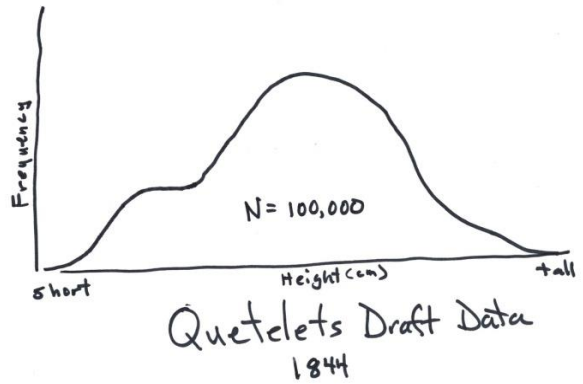
We Are All Equal?

In the United States, we have a formal statement in our "Bill of Rights" that says "**we are all created equal**," and many of the assumptions of political democracies that give everyone an equal vote in determining leadership is built on this assumption of…equality. But are we really equal? Do the differential outcomes we observe in sports and life come about only through differences in ….opportunity? What does the data on individual aptitude and performance actually show us?

The British scholar who almost single-handedly created the study of "individual differences" was Francis Galton, later "Sir Francis Galton" for his work in this area of research. Galton was himself a child prodigy, and in his mid-life started to critically examine WHY he was smarter than other kids. His cousin, Charles Darwin, had presented the seminal work (1859) on natural selection as THE process for explaning species evolution, and Galton picked up on this general concept of hereditary feature change to explain….variations as he observed in….intelligence. Galton developed the first IQ tests and he measured reliable DIFFERENCES in individual abilities, which he later confirmed were ALL related positively to one another. That is people who were better at reaction time were better at line estimation were better at rote memory, etc. This led Galton (1869) to posit that intelligence was a general quality of varied capacity in humans. Galton actually tested a wide variety of people and then also looked at …family histories to assess if such ability differences were consistent within families….which he found; he also found that intelligence as he measured it with "real world achievements" was recessive genetically on females. Females in families with high achieving, competent, and very successful males were invisible in terms of their own contributions to society! Remember now that Galton was doing his research in the period from around 1860 to 1910, so just possibly cultural/social issues might have contaminated his data for women, BUT he never saw that possibility !!!! Being an estimated 204 IQ did not protect him from the cultural bias deeply embedded in his experience.

In the United States, the Stanford-Binet test was widely used to measure intelligence, and Lewis Terman, another American Psychologist further advanced the measurement of IQ with new forms of paper and pencil tests. Today, we know that there are measurable differences in intelligence that relate to educational and professional achievement and similar variability in almost every possible personality quality, from abasement to sexuality and aggression. It would further appear that Galton was partially correct for most of these measured individual differences have a STRONG genetic component, perhaps up to about 60% genetic influenced.

We should also recognize that one of Galton's other contributions was the incorporation of statistical methods into psychology, he built on the work of an earlier mid-18th Century European scholar, DeMoivre who gave us the …normal curve in 1733. Another scholar, Quételet noted that human characteristics such as height, weight, and strength were normally distributed. Quetelet used this insight to confirm "draft dodging" in French Army recruits under.



Napoleon using data on the height of actual recruits vs what should have been observed with the normal curve.

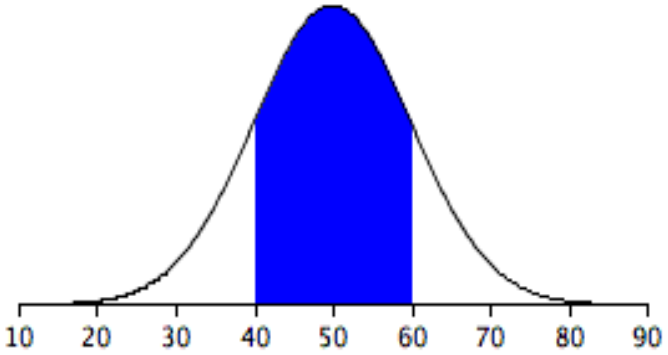


Figure 1. Normal distribution with a mean of 50 and standard deviation of 10. 68% of the area is within one standard deviation (10) of the mean (50).

Psychological Insight: So the final argument for "we are created equal" is that such is clearly NOT the case, based on hard data from a variety of aptitude, ability, and personality measurements and even more concrete data on simply physical qualities. Virtually every aspect of the human experience and condition is…normally distributed.

Childhood Is A Time Of Play or Work?:

In the Middle Ages, children were treated as "little adults" and thus it was normal for them to work at menial jobs. With the coming of the Industrial Age, children were frequently assigned heavy work in the emerging factories of Europe…and still are sometimes seen in such in the Far East and third world countries today. In the strong reaction to such oppressive demands on children, in the late 19th Century there was a romantic idea of childhood as a time of random and free…play. A time to "let the child become whatever they chose," and some private schools still follow this child-centric view of intellectual and social development. But these ideas are examples of intuitive and tenacity based beliefs about childhood.

What Does Modern Psychological Research Say About Childhood?

We now have a major sub discipline called "cognitive development." This area of

psychology has confirmed that even before birth the fetus is already …learning and is aware of sounds around the mother's body. From birth the new infant is immediately beginning to learn more external details like the smell and voices of the immediate family members giving care. By age two years, though usually not creating sentences, the young child knows much of the basic grammar of the culture in which they exist.

What parents call "play" is simply the child's efforts at exploring and learning about the world into which they were born. Guided play, with the parents providing leadership and age relevant toys which have educational impact are now known to promote advances in cognitive growth and development. Going back to the example of Francis Galton, he was tutored attentively by his older sister from age 2 and by 3 years old he was reading and by 5 he was carrying on correspondence, in French, and had mastered the British coinage system of that time.

In the United States, based on our increasing Psychological Science of Childhood, the government treats youngsters separately in the legal system, and provides "Head Start" programs in low income areas to promote and equalize "cognitive development" which has been confirmed to be compromised in many lower income families. Psychological Insight: Childhood is a period of constant learning; more thoughtfully structured learning opportunities lead to advantages in cognitive development throughout childhood.

Final Conclusions to consider:

Casual observations and intuitions about human behavior can be helpful, but careful research, with good sampling and careful measurements can give us much better information to advance our real understanding of the "human condition."

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Стаття надійшла до редколегії: 16.12.2017