



**KARMA**GENES  
meet yourself



*Everything you would like to know  
about Genetics, Psychology & Personality*

# Karmagenes

## Background content

01

Behavioral Genetics

02

The Science Behind  
Karmagenes

03

From DNA to Behavior

04

5 Factors Personality  
(Big 5/OCEAN)

## Behavioral Genetics Timeline

### Plato

Plato, one of the founders of Western philosophy, first introduced the terms Nature and Nurture, in his Protagoras dialogue.

380 BC

### Hereditary Genius

Victorian polymath Sir Francis Galton, officially introduced the notion of "Nature vs Nurture" in his book *Hereditary Genius* (1869), the first social scientific attempt to study [genius](#) and [greatness](#). He is considered the father of modern-day behavioural genetics.

1610

1869

### William Shakespeare

In Shakespeare's play *The Tempest*, protagonist Prospero notes: "A devil, a born devil, on whose nature Nurture can never stick; on whom my pains, Humanely taken, all, all lost, quite lost; And as with age his body uglier grows, So his mind cankers. I will plague them all, Even to roaring."

### Fitter Families

Fitter Families, were contests first launched in 1920 in Kansas with the support of the American Eugenics Society, aiming to identify and reward the family with the highest degree of psychological and physical fitness among its member, as measured by a team of medical doctors.

1913

1920

### Theodore Roosevelt

Theodore Roosevelt in his letter to Charles Davenport : "Some day we will realize that the prime duty, the inescapable duty, of a good citizen of the right type is to leave his or her blood behind him in the world."

1930

### Eugenic movement

This period witnessed a sharp increase in the number of scientific publications researching heritability of behaviour. Meanwhile, the popularity of Eugene as a given name increases too.

### Buck vs. Bell court case

Buck vs. Bell refers to a decision of the US Supreme Court in which the Court ruled that a state statute permitting compulsory sterilization of the unfit, including the intellectually disabled "for the protection and health of the state" did not violate US Constitution. The decision was largely seen as an endorsement of [negative eugenics](#)—the attempt to improve the human race by eliminating "defectives" from the [gene pool](#).

1927

1939

1945

### WW II & Eugenics

Knowledge and scientific achievements can be destructive in the wrong hands and history has shown us many times the extent of harm that could be imposed when science is applied in the wrong context. Nazis focused on the racial improvement of the Germanic "Übermenschen" master race through eugenics. The British Psychological Society mentioned: 'The notion that behavioral traits are passed "on" from one generation to another, "in the blood", has been common currency for a very long time. It has been used to justify racism, persecution and genocide, it has been used to stereotype individuals, and it has been used to proclaim the superiority of an individual or group over others.'

### Recognition and Momentum

Behavior genetics field gained momentum and gratitude as a research discipline followed by the publication of the textbook *Behavior Genetics* by John L. Fuller and William Robert Thompson marking the era of new discoveries.

1960

1960

## Pioneering the Field

Irving Gottesman was a pioneer in the field of behavioral genetics and his Ph.D. thesis contained scientific data and publications highlighting the high levels of inheritance in the scales related on the genetics of personality.

## The Jim twins

The story of the two Jim twins who were separated at birth and reunited at the age of 39 is a fascinating one. They both married to different women called Linda, and after both getting a divorce, the remarried to different women both called Betty. And that's not all about it; they both had sons with James Allan being their given name, and pet dogs that were called Toy.

1979

## Twins Heritability

According to T. J. Bouchard's work known as the Minnesota Study of Identical Twins Reared Apart (MISTRA), shyness, political conservatism, dedication to hard work, orderliness, intimacy, extroversion, conformity, leadership and a host of other social traits are largely heritable, as can be observed between identical twins reared apart from their co-twins.

1989

## Steve Jobs

"I used to be way over on the nurture side, but I've swung way over to the nature side. And it's because of Mona and having kids. My daughter is 14 months old, and it's already pretty clear what her personality is."

1997

## Human Genome Project

The Human Genome Project that was initiated in 1990 with the aim to sequence the entire human genome and map all its genes. This international largest collaborative biological project spanned over 13 years long of scientific research.

2003

## Behavioural Genetics used as evidence

Behavioral genetics was first time used during a lawsuit, so as to avoid a first-degree murder conviction by using an argument on a combination of genes and a history of child abuse.

2009

## Twin Reading Ability

Study conducted on samples from USA, Australia and Scandinavia measuring individual differences in reading ability. Both US and Australia showed primarily genetic influences whereas environmental influences coupled with genetic was observed in Scandinavia.

2013

## Swedish Twin Registry

The Swedish Registry was established in the 1960s to study how smoking affects our health. There is, at present, information on approximately 85 000 twin pairs, both monozygotic and dizygotic. There are currently around 30 ongoing behavioral studies based on the Swedish twin registry.

1960

2015

## PubMed National Library of Medicine and Science

PubMed, the US National Library's online Life Sciences resources database, lists 21.683 scientific publications, to date

2015

## Karmagenes, SA

Karmagenes brings together Nature (DNA and Objectivity) and Nurture (Environment and Perception) by providing its DNA based personality test combined with the Big 5 psychological findings. Karmagenes vision is to bring science and genetics into people's daily life in a positive, accurate and scientific way.

# The Science behind

# Karmagenes

**S**ingle  
**N**ucleotide  
**P**olymorphism



a single letter change in the DNA



**SNPs are what make us UNIQUE**

## What is DNA?

DNA, or deoxyribonucleic acid, is the hereditary material in humans. Human DNA consists of about 3 billion bases, and more than 99,6 percent of those bases are the same in all people. DNA is stored as a code made up of four chemical bases called "nucleotides": adenine (A), guanine (G), cytosine (C), and thymine (T) and their order determines the information available to be used later, similar to the way in which letters of the alphabet appear in a certain order to form words and sentences.

## What is a GENE?

Made up of "small chunks" of DNA, genes act as guidelines to make molecules called proteins. Humans have two copies of each gene, one inherited from each parent. The Human Genome Project ( Approximately 3bn USD ) has estimated that humans have between 20,000 and 25,000 genes. Less than 1 percent of the total amount of genes contains a small difference that contributes to each person's uniqueness.

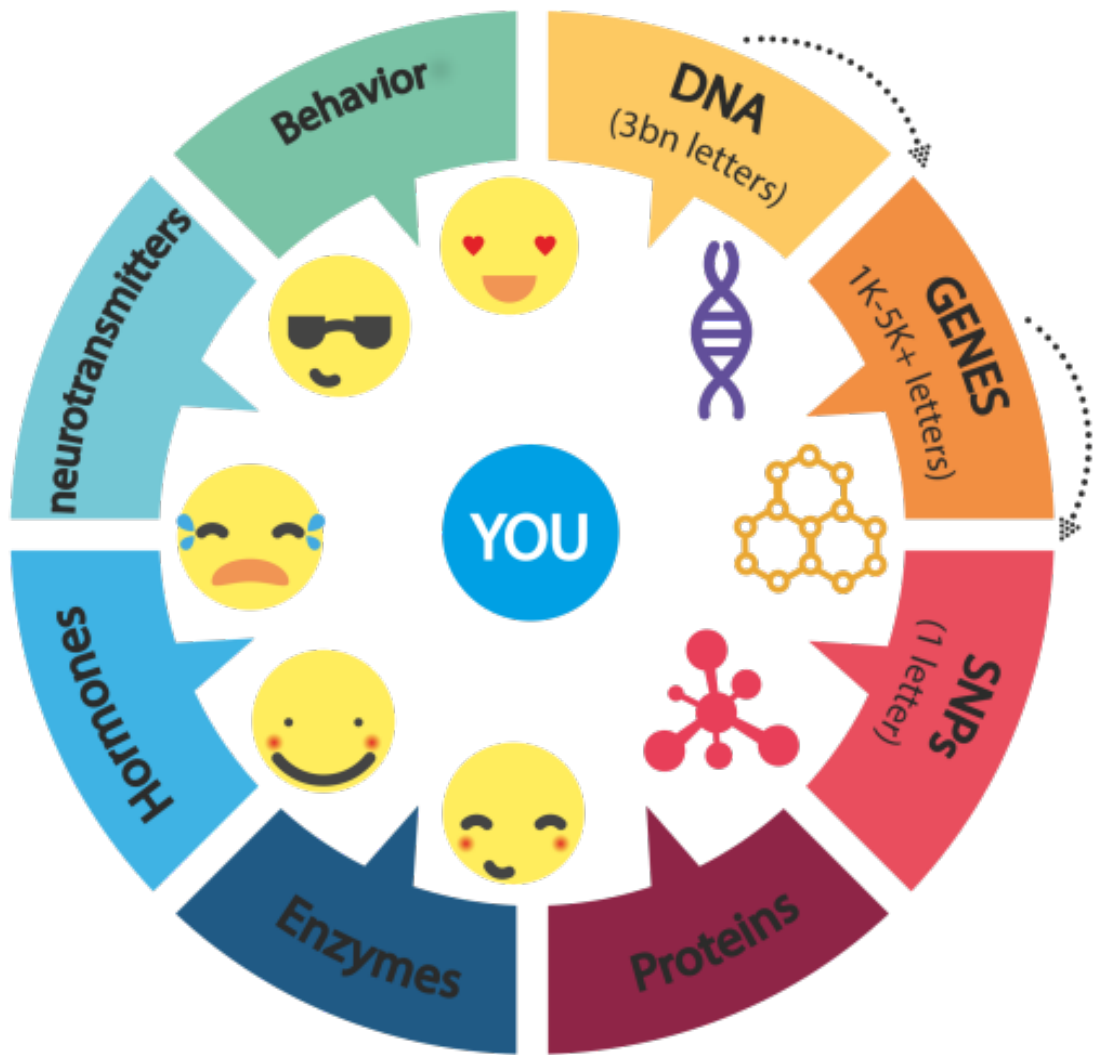
## What is an SNP?

SNPs are the most common type of genetic variation among people. Each SNP represents a difference in a single DNA building block. SNPs occur normally throughout a person's DNA. On average, they occur once in every 300 nucleotides, which means there are roughly 10 million SNPs in the human genome.

## How we do it?

We extract your DNA from your salivary epithelial cells (SWAB), then we sequence your DNA in an ISO certified Swiss laboratory. We use bioinformatics to analyze and identify your SNPs, then we apply our proprietary algorithm constructed on a polygenic approach that links multiple SNPs and Genes with each of the behavioral characteristics to compute the values and generate the final results.

# From DNA to BEHAVIOR



SNPs affect the amount of hormones produced, thus influencing our behaviour



## 5 Factors Personality Timeline

# 1880's

The Lexical Hypothesis, initiated by Sir Francis Galton in 1884, is a major foundation of the Big Five personality traits, stating that by sampling languages (17000 words) it will be feasible to develop a comprehensive taxonomy of human personality traits.

G. Allport and S. Odbert psychologists in 1936 placed Sir Francis Galton's hypothesis into practice by narrowing down the amount of adjectives describing possible traits from 17000 words into 4,504 labeled factors.

# 1930's

# 1950's

In 1957, by eliminated synonyms, psychologist Raymond Cattell reduced the total factors to 171 and then divided them into 36 traits

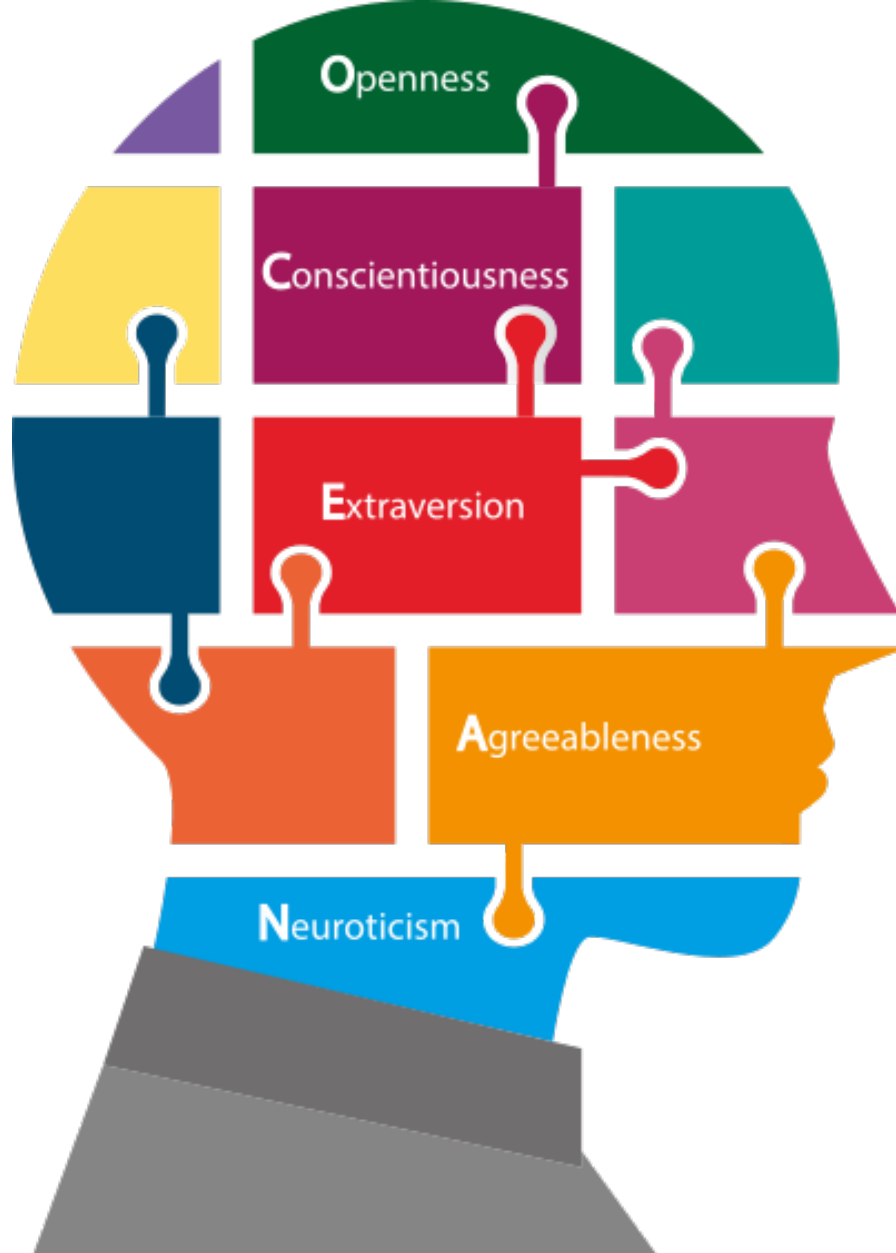
Psychologist Warren Norman in 1963, reduced them into just 5 broad factors.

# 1960's

# 1980's

In 1981, psychologist Lewis Goldberg initiated his own lexical project, emphasizing five broad factors once again then He later coined the term "Big Five" as a label for the factors.





## BIG 5 (OCEAN)

The five factor model that describes five basic human personality traits regardless of language or culture derived from statistical analyses of which traits tend to co-occur in people's descriptions of themselves or other people. The Big Five is now the most widely accepted and used model of personality to study personality in terms of how it changes over time and how it relates to other variables.

## BIG 5 & DNA (Heritability)

Recent twins studies published in top, peer reviewed scientific journals, have shown that not only environmental factors contribute to personality, but genetics too influence the 5 factors as follows: openness 57%, extraversion 54%, conscientiousness 49%, neuroticism 48% and agreeableness 42%.



**O**penness: Individuals scoring high on “openness” are adventurous, curious and creative. They are open-minded, challenge seekers and keen to step out of their comfort zone and monotonous routines to acquire novel things that boost their knowledge

**C**onscientiousness: Individuals scoring high on “conscientiousness” are self-disciplined, highly responsible, organized and punctual. They tend to be workaholics and almost never act impulsively, executing their daily tasks in the most disciplined manner.

**E**xtraversion: Individuals scoring high on “extraversion” are extremely social and friendly. They are talkative, attention seekers and uncomfortable being alone. Always present on parties and events, engaging in deep discussions at the center of attention.

**A**greeableness: Individuals scoring high on “agreeableness” are associated with good behavior. They are trustworthy, honorable, well-mannered and express concern and respect in their communication. Well known to be helpful, cooperative and empathetic when interacting with other.

**N**euroticism: Individuals scoring high on “neuroticism” are moody, nervous and stressed. They are emotionally unstable and most of the time anxious. Mostly manage to grasp the negative side of things and they are susceptible to induction of negative mood.

STEVE  
JOBS

Openess



ALBERT  
EINSTEIN

H

L

GEORGE W.  
BUSH

SARA  
PALIN

JIM  
CARREY



Extraversion

KATY  
PERRY

H

L

ROBERT  
PATTINSON

LISA  
SIMPSON

QUENTIN  
TARANTINO



Neuroticism

WOODY  
ALLEN

H

L

MARGARET  
THATCHER

CHUCK  
NORRIS

BILL GATES

Conscientiousness



SUPERMAN

H

L

BIG  
LEBOWSKI

HOMER  
SIMPSON

NELSON  
MANDELA



Agreeableness

MOTHER  
TERESA

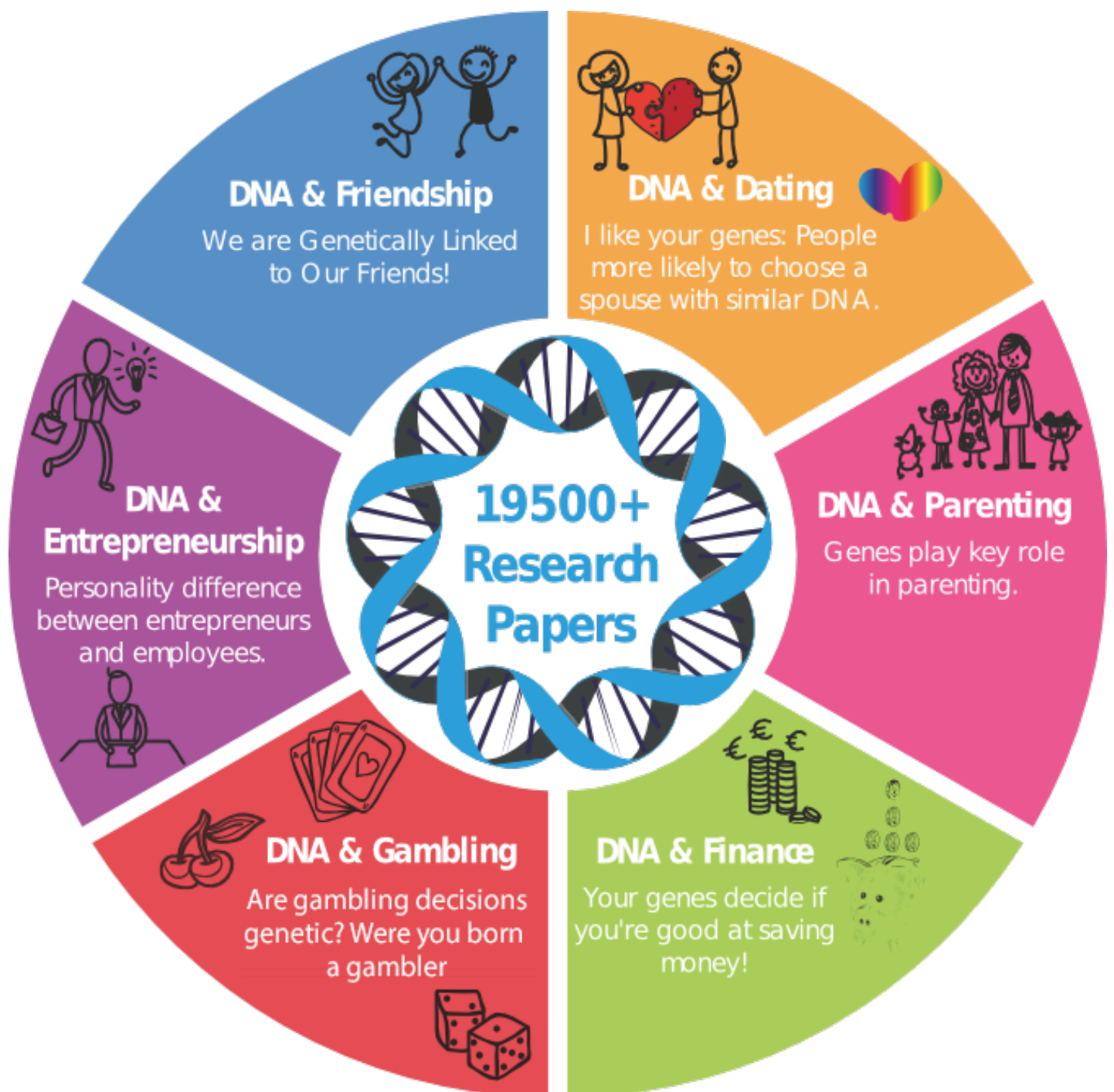
H

L

DICK  
CHENEY

SIMON  
COWELL

# References



# Selected Literature and Readings

## DNA and behavior in the media

1. Are gambling decisions genetic? Are you a born gambler?
2. Genes play key role in parenting.
3. We are genetically linked to our friends.
4. I like your genes: People more likely to choose a spouse with similar DNA.
5. Cheating on your other half can be inherited.
6. Your genes decide if you're good at saving money, academics say.

## Big5 and Psychology

13. The Nature and Structure of Correlations Among Big Five Ratings: The Halo-Alpha-Beta Model
14. Is there a "Big Five" in Teamwork?
15. The General Factor of Personality: A meta-analysis of Big Five intercorrelations and a criterion-related validity study.

## Core Science

7. Tryptophan hydroxylase-2 gene variation influences personality traits and disorders related to emotional dysregulation.
8. Polymorphisms in the dopamine D4 receptor gene (DRD4) contribute to individual differences in human sexual behavior: desire, arousal and sexual function.
9. Oxytocin Modulates Female Sociosexual Behavior through a Specific Class of Prefrontal Cortical Interneurons.
10. The Origins of Savings Behavior.
11. The relationship between nature connectedness and happiness: a meta-analysis.
12. Classical twin studies and beyond.

## Interesting Documentaries

James Watson video "How we discovered DNA"

Professor Matt McGue: "Behavioral Genetics | How twins saved psychology"

## PubMed Library

1000+ scientific publications regarding the Big 5

20000+ scientific publications regarding Human Behavioral Genetics

34000+ scientific publications regarding Behavioral Genetics

Connect with us!

