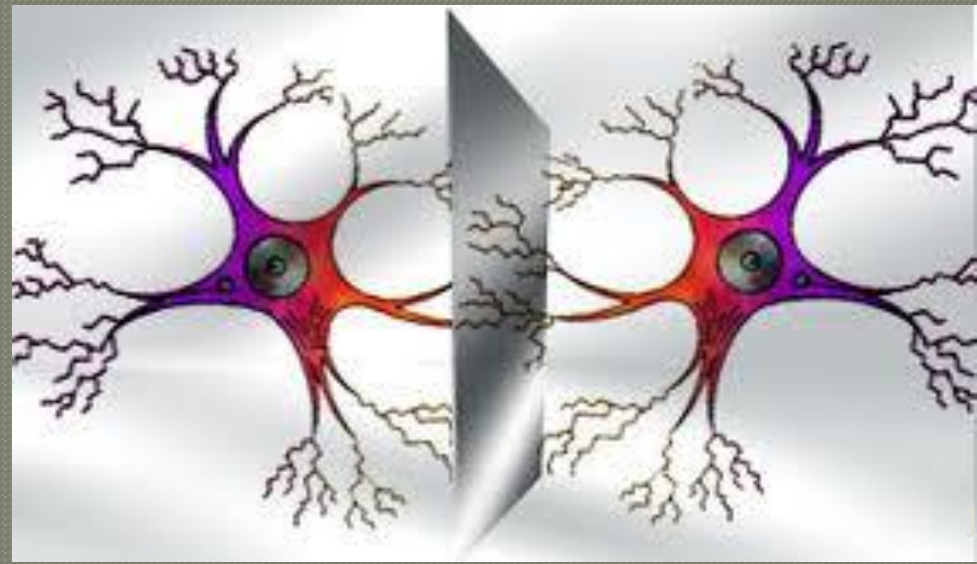
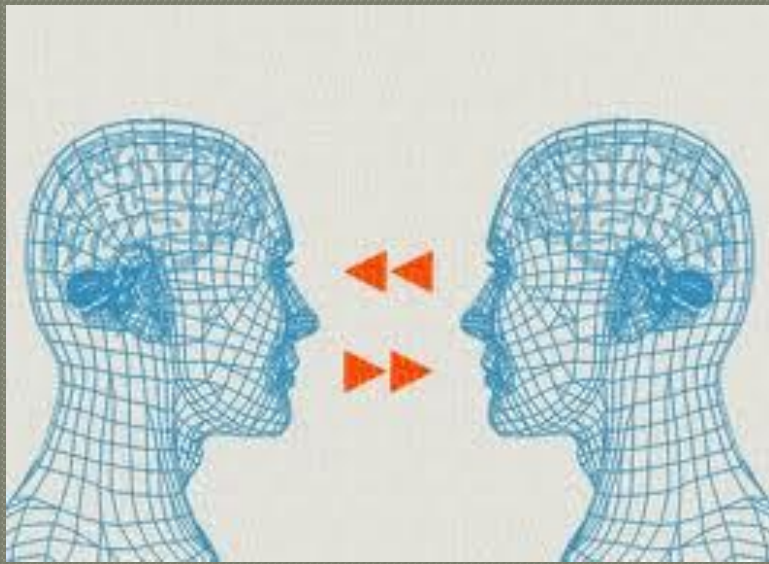
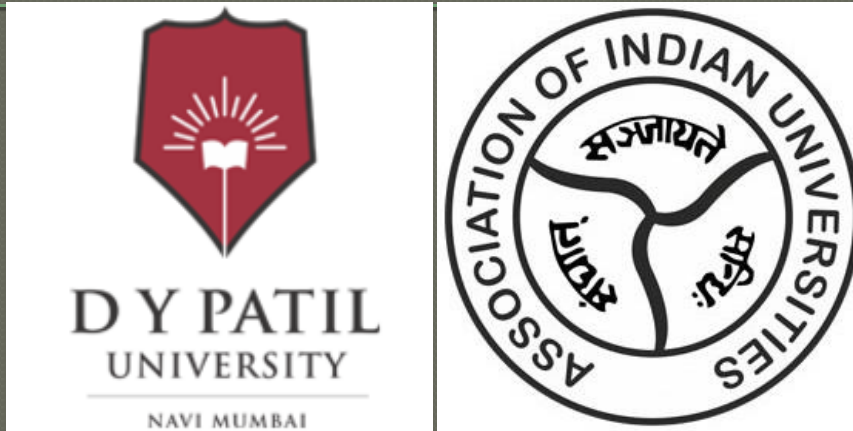


Mirror neurons and Sports

Mirror neurons and Values



AIU WEST ZONE VICE CHANCELLORS' MEET 2018



“ Excellence in Sports in Higher Education
Institutes (HEI): Opportunities & Challenges”

30th November - 1st December 2018

Prof. Dr. Arun Jamkar,
MS, Ph D (Surgical Oncology)
FICS, FMAS, FIAGES, FAIMER fellow

**Former Vice Chancellor,
Maharashtra University of Health
sciences
Nashik**

Mirror Neurons

What is a Mirror Neuron?

Where are Mirror neurons situated?

Dogmatic Evidence in Human Brain

Applications based on Mirror neurons

Mirror neurons and Sports

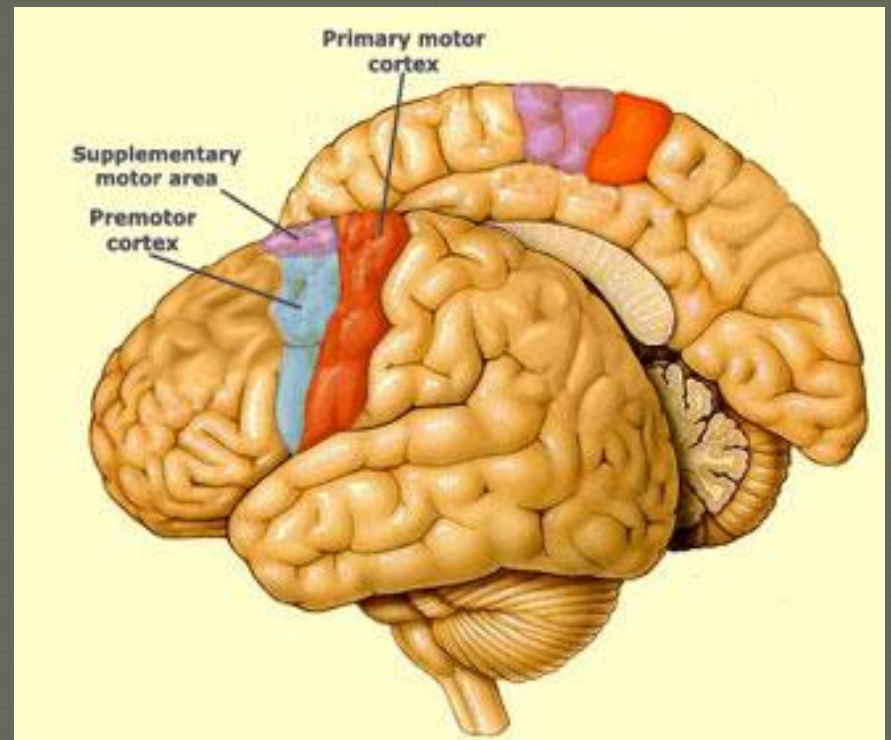
Mirror neurons and values

Mirror Neurons and sports skills

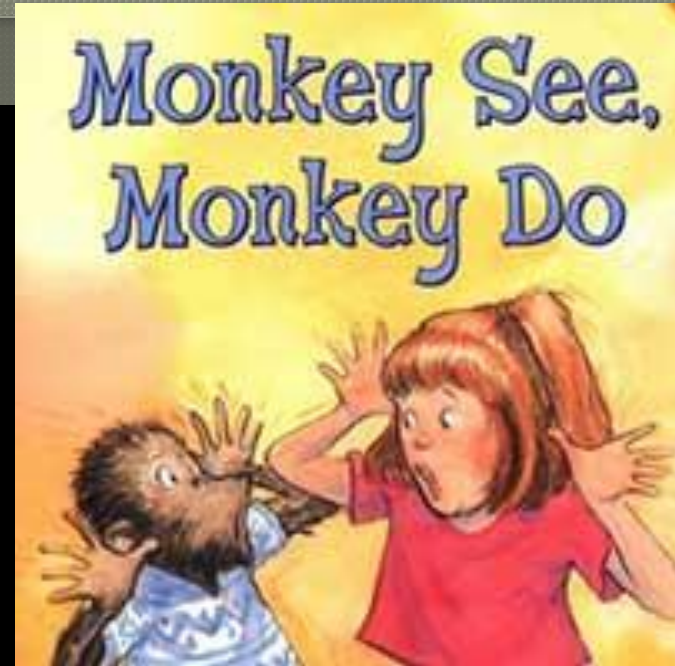
RSAanimat

What is a Mirror Neuron?

- A specialized cell in the brain



Rizzollati (1996) studied macaque monkeys and discovered a curious cluster of cells in the ventral pre-motor area of the brain's frontal lobes



The monkey fired the same set of Neurons when the monkey grabbed a peanut or watched somebody else grab a peanut.



Baby Mirrors

- ◉ Mirror neurons are active in as young as 41 minute-old babies
 - Imitation of simple facial expressions
- ◉ Motor Template building begins with infant & caregiver
 - Expressions, gestures, and later speech sounds

Baby Mirrors in Action



IMITATION

- **Piaget suggested that babies learn to imitate**
- **Mirror neurons tell us that babies imitate to learn – from the first hour of their lives**

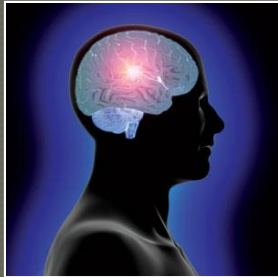


Child learning by imitation





Role of 'Mirror Neuron System' In Humans



Mirror neurons



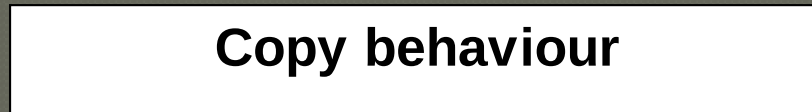
**Observation of behaviour
(e.g. emotions) of other
people**



**Social organisation of
behaviour (e.g. empathy)**



Copy behaviour



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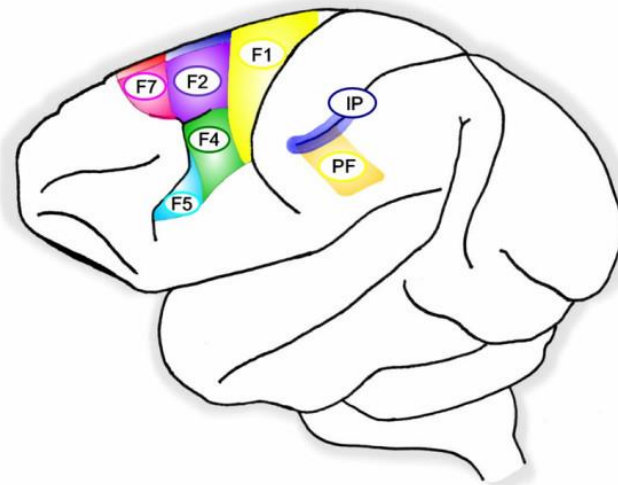
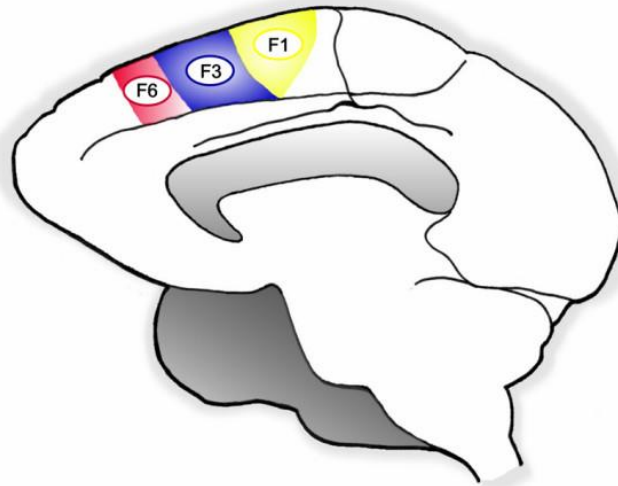
Mirror Neurons and sports skills

Mirror neurons and values

Where are Mirror neurons situated

- Found in several areas of the brain - including the pre motor cortex, the posterior parietal lobe, the superior temporal sulcus and the insula –
- They fire in response to chains of actions linked to intentions.

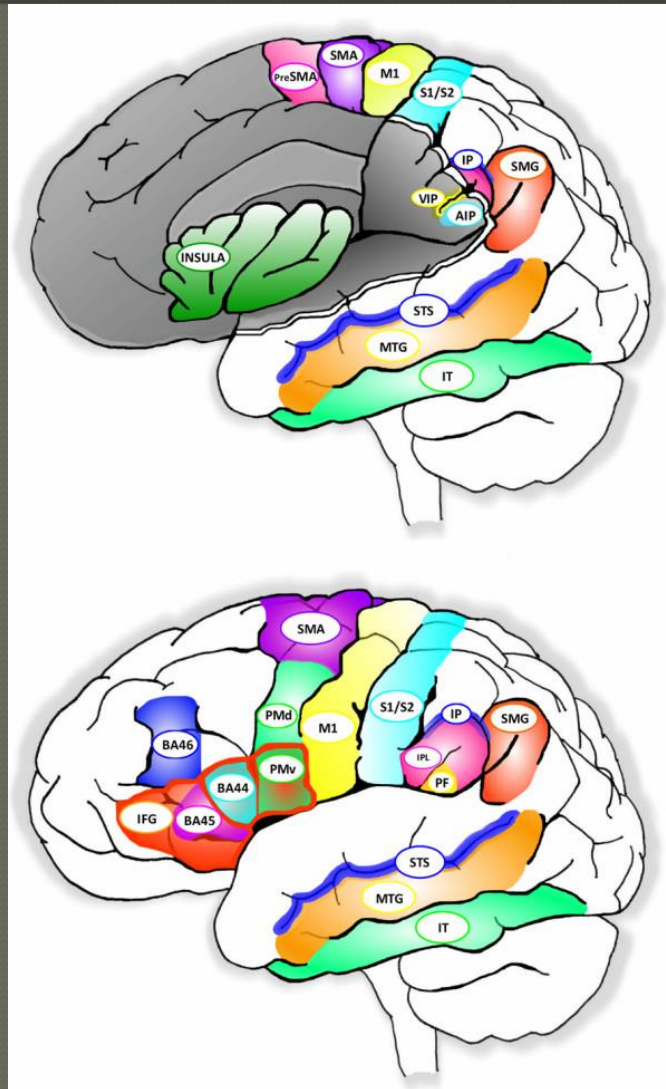
Anatomical view of a Monkey brain showing areas involved with the mirror neuron system



Brain imaging experiments using functional magnetic resonance imaging (fMRI) have shown that the human inferior frontal cortex and superior parietal lobe



Anatomical view of a human brain showing areas involved with the mirror neuron system.



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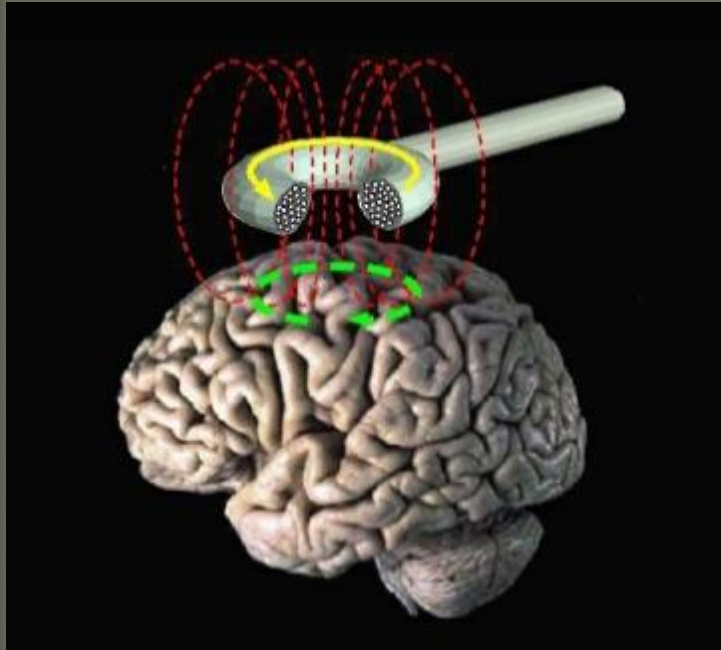
Transcranial magnetic
stimulation

Implanted with intracranial
depth electrodes

Vincent Walsh, and Cecilia Heyes, researchers at
University College London's
Institute of Cognitive Science,

- Transcranial magnetic stimulation" (or TMS), in which magnetic pulses are passed through the skull to induce brief electrical currents in the underlying brain tissue.
- Stimulated the hand-related portions of motor cortex of human volunteers while they watched videos of hands performing movements of the index or little finger





- TMS of motor cortex hand areas results in electrical neural impulses being transmitted to the hand itself, where these impulses can be measured by placing electrodes over the finger muscles.
- when a volunteer watched index finger movement, motor-cortex stimulation by TMS led to stronger electrical signals in the participant's own index finger compared to the pinky, and vice-versa when watching pinky finger movement
- **This is a mirror-neuron-like effect.**

UCLA researchers make first direct recording of mirror neurons in human brain

- The patients had been implanted with intracranial depth electrodes to identify seizure foci for potential surgical treatment
- The experiment included three parts: facial expressions, grasping and a control experiment. Activity from a total of 1,177 neurons in the 21 patients was recorded as the patients both observed and performed grasping actions and facial gestures

- The researchers found that the neurons fired or showed their greatest activity both when the individual performed a task and when they observed a task.
- The mirror neurons making the responses were located in the medial frontal cortex and medial temporal cortex,
- Two neural systems where mirroring responses at the single-cell level had not been previously recorded, not even in monkeys

Dr. Itzhak Fried, a UCLA professor of neurosurgery

Roy Mukamel, Arne D. Ekstrom, Jonas Kaplan and Marco Iacoboni

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Yawning
mediated
through
Mirror
Neurons

Yawning is infectious



[Brain Imaging Behav.](#) 2013 Mar;7(1):28-34. doi: 10.1007/s11682-012-9189-9.

Mirror neuron activity during contagious yawning--an fMRI study.

[Haker H](#), [Kawohl W](#), [Herwig U](#), [Rössler W](#).

Smiling is infectious
through
Mirror neurons

“I predict that mirror neurons will do for psychology what DNA did for biology: they will provide a unifying framework and help explain a host of mental abilities that have hitherto remained mysterious and inaccessible to experiments.”

-V.S. Ramachandran



Empathy mediated through Mirror neurons



Process in Brain during empathy



- ◉ Watching pain/sensation
- ◉ negative Feedback from that organ
- ◉ Brain declares "It is not mine"
- ◉ Empathy feeling

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Why people watch sports ?



- millions of fans who watch their favorite sports on television are hooked by mirror neuron activation.
- In someone who has never played a sport - say tennis - the mirror neurons involved in running, swaying and swinging
- But in someone who plays tennis, the mirror systems will be highly activated when an overhead smash is observed



Dr. Iacoboni

ports and Mirror neurons

- Professional athletes and coaches, who often use mental practice and imagery, have long exploited the brain's mirror properties perhaps without knowing their biological basis,
- Observation directly improves muscle performance via mirror neurons

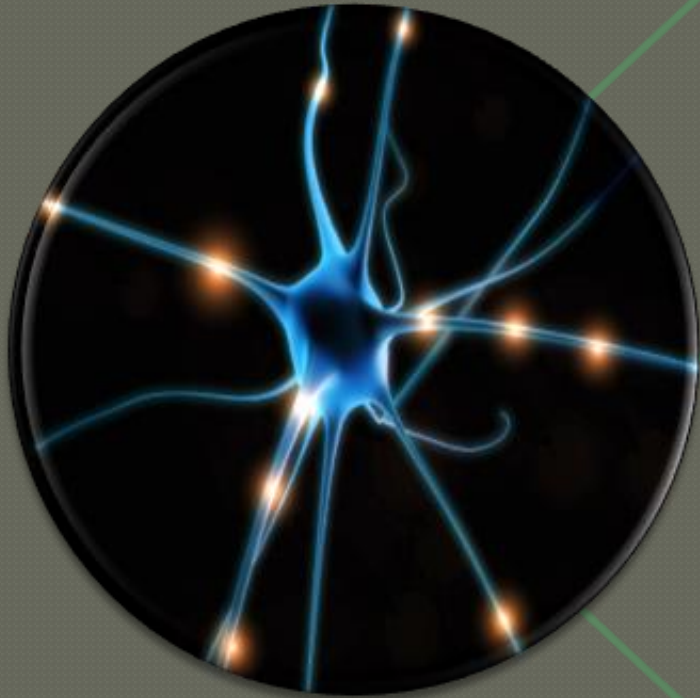
Chak De India



Acting
and
Mirror
neurons

Mirror
Neurons
and
Music

Imitative
Violence



Mirror Neurons : Violence watched by kids

- A study in the January 2006 issue of Media Psychology found that when children watched violent television programs, mirror neurons, as well as several brain regions involved in aggression were activated, increasing the probability that the children would behave violently.

Mind reading

- Mirror neurons appear to form a cortical system matching observation and execution of goal-related motor actions.
- Two different accounts of mind-reading have been suggested.
- According to 'theory theory', mental states are represented as inferred posits of a naive theory.
- According to 'simulation theory', other people's mental states are represented by adopting their perspective: by tracking or matching their states with resonant states of one's own.
- The activity of mirror neurons, and the fact that observers undergo motor facilitation in the same muscular groups as those utilized by target agents, are findings that accord well with simulation theory but would not be predicted by theory theory.

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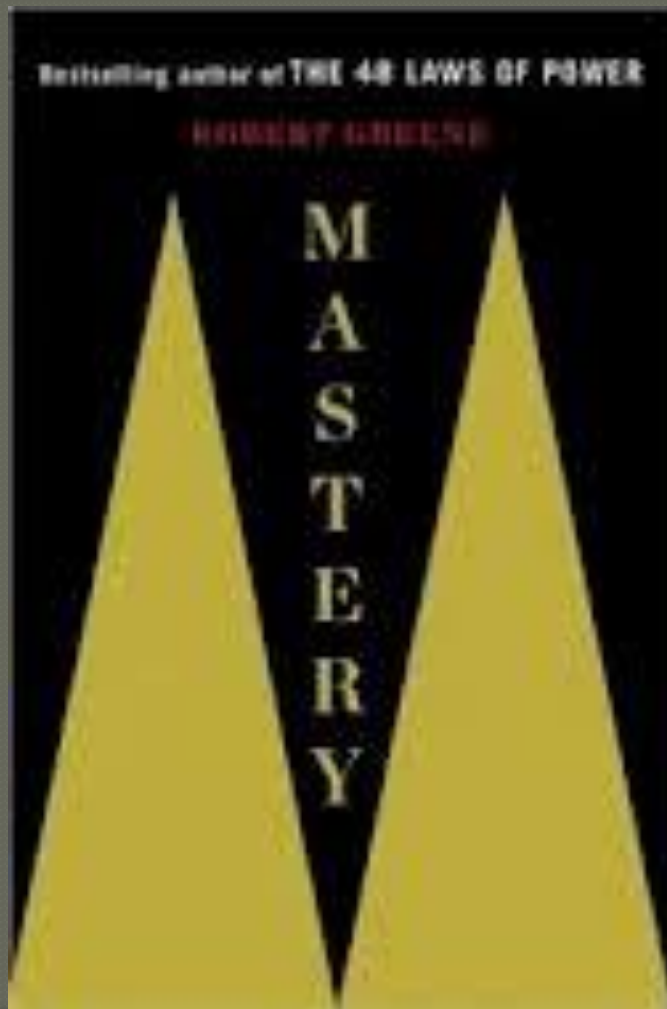
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Mirror neurons and Sports

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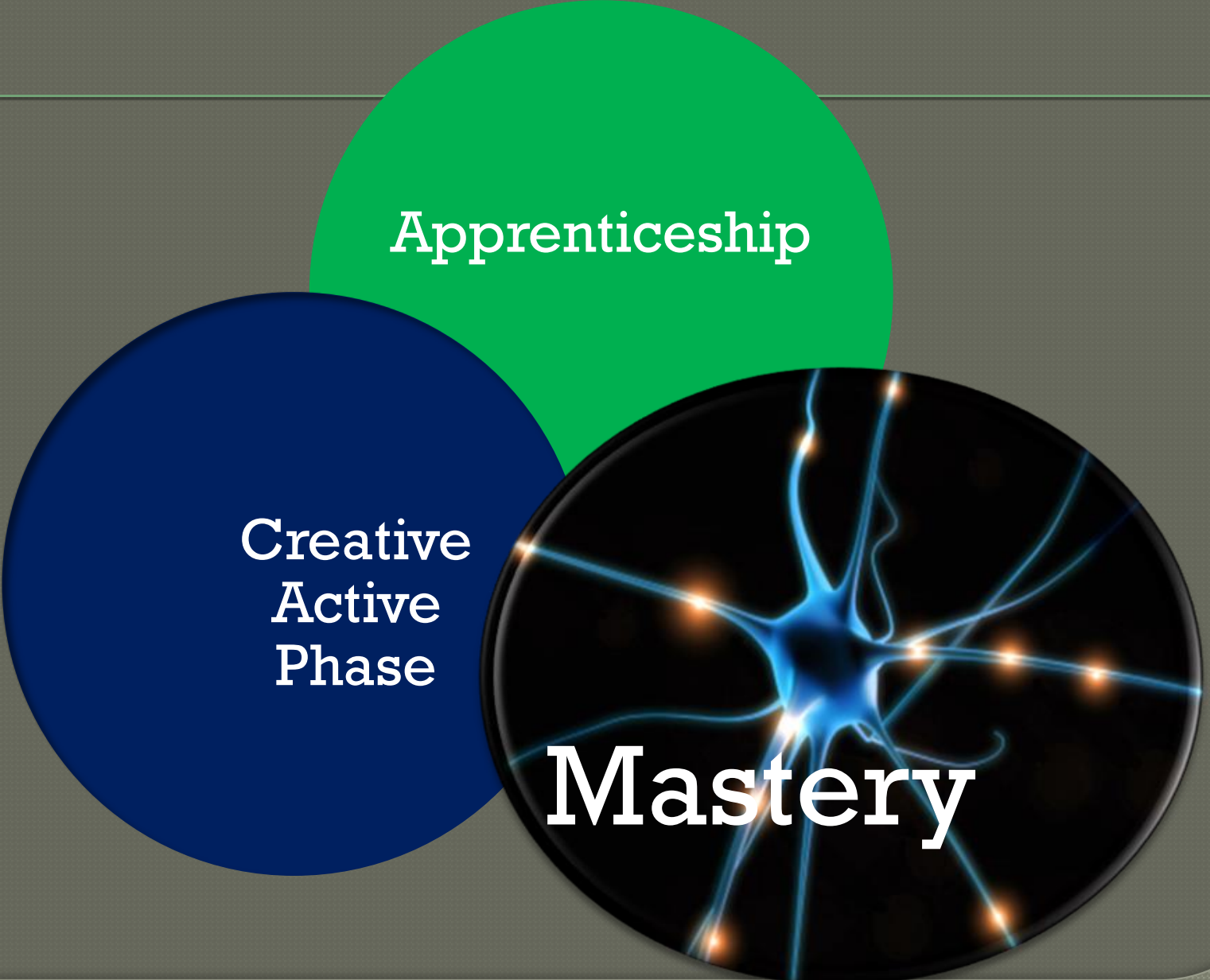
Mastery : Robert Green



Apprenticeship

Creative
Active
Phase

Mastery



Four stages of competence

Abraham Maslow

- ◉ Initially described as “Four Stages for Learning Any New Skill”,
- ◉ The theory was developed at the Gordon Training International by its employee Noel Burch in the 1970s.
- ◉ It has since been frequently attributed to Abraham Maslow, although the model does not appear in his major works.

- Not aware of a skill you lack

Unconscious Incompetent

- Aware that you lack the skill

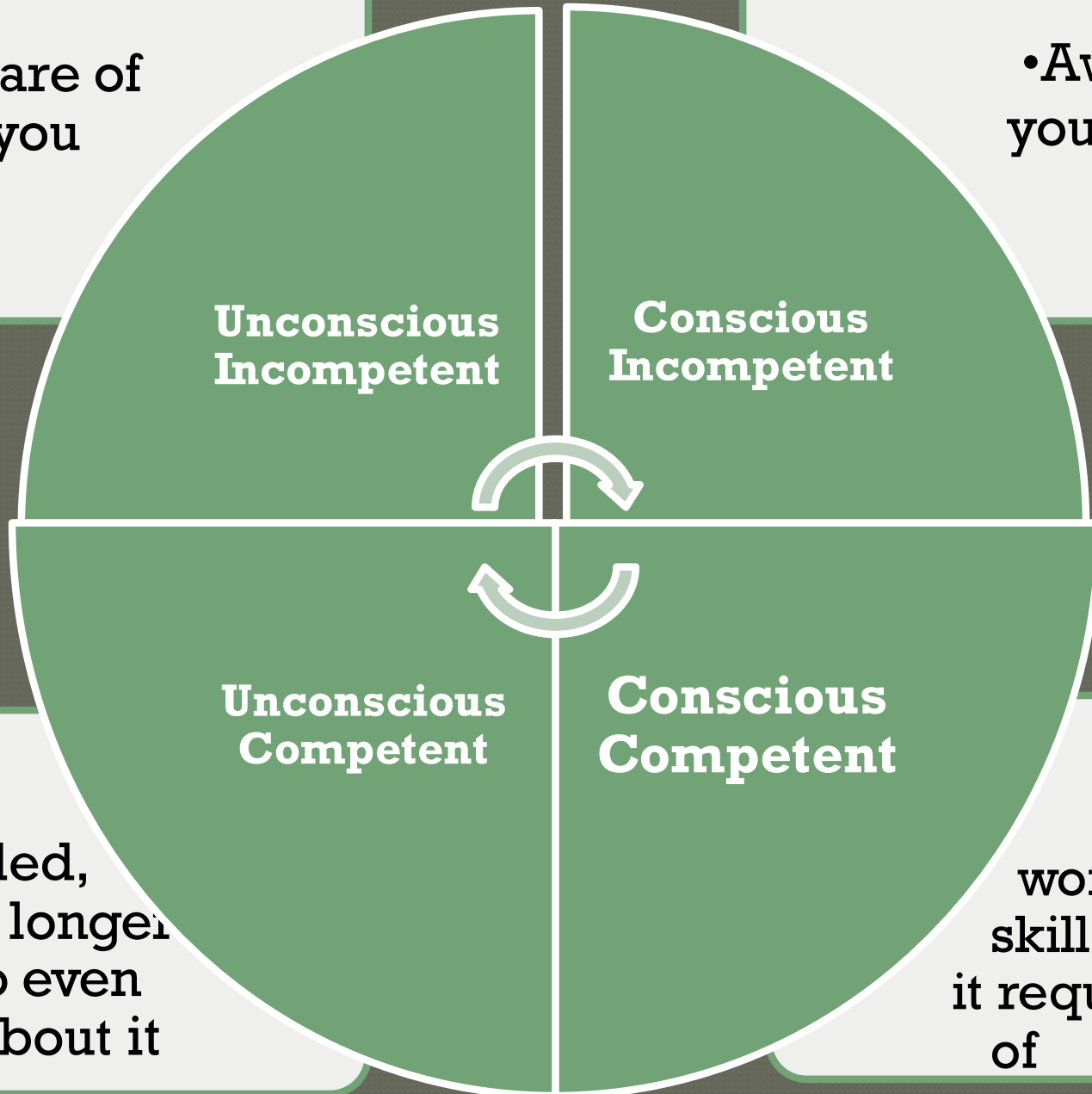
Conscious Incompetent

Unconscious Competent

- So skilled, you no longer have to even think about it

Conscious Competent

- Actively working at a skill although it requires a lot of thought



Sports skill training

Apprentiship



- Watch each movement carefully
- Mirror neurons will be fired
- Mental Imitation of that movement
- actual doing that movement
- Two different area in brain
- Repeated steps will create grooving in motor cortex



- ◉ Watch both hand movements as well as effect of that movement
- ◉ Say in mind the splitting of movement

How to repeat an Ace in Tennis



- Play the VDO of last ACE
- Or any other Ace you have seen
- Try to imitate that action at beginning
- It will be automatic in rest

THE INNER GAME OF TENNIS

(TIMOTHY GALLWEY)

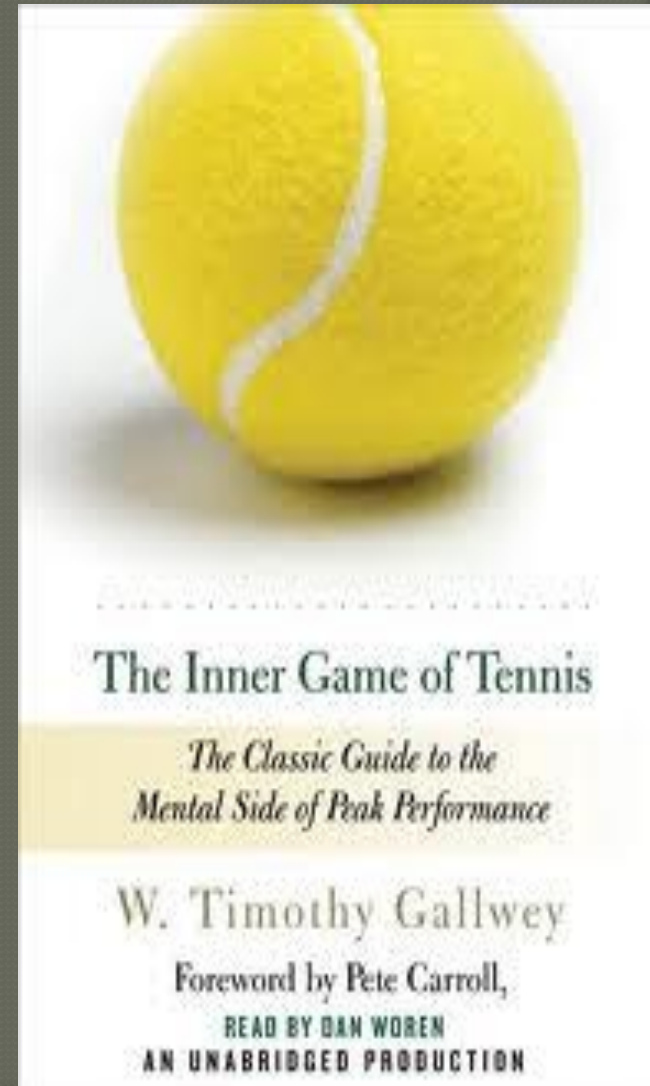


Sports skill training

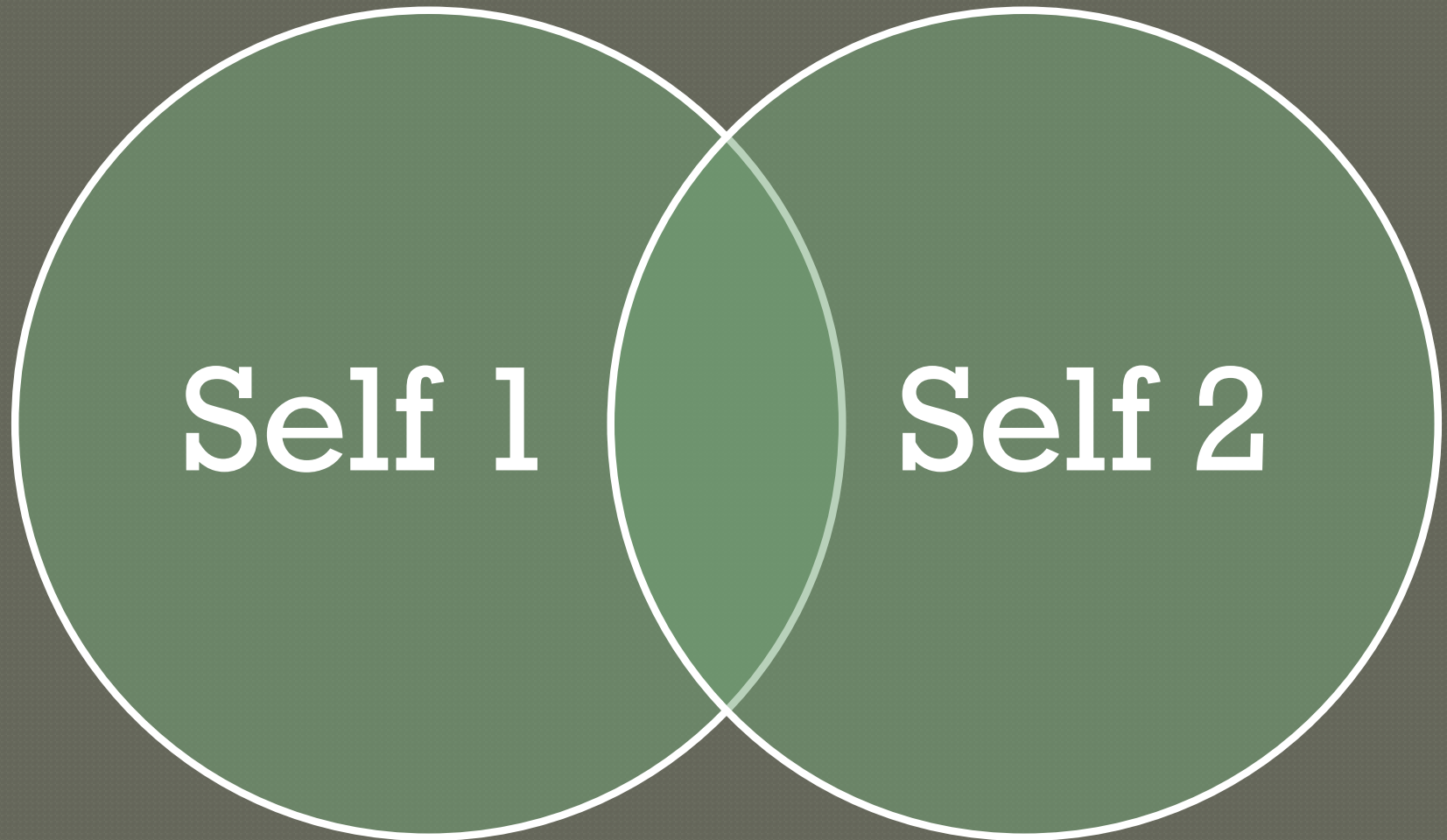
Creative Active Phase

Inner game
of Tennis

Guru shishya
Parampara



Inner game Of Tennis



Inner game of Tennis

Timothy Gallaway

Each player has 2 "selves." Self 1 is ego-mind or "teller" ("Hit the ball like this") & Self 2 is natural ability or "doer" (the actual movement of the muscles to hit the ball).

Sports skill training

Mastery

Equipment and
instruments should be
part of your body

Ability to think inside

Helping a Active player

- Anticipating the steps
 - Mind reading
 - Gesture reading
- Teamwork building
- Scientific evidence

*"I am a brain, my dear
Watson, and the rest of me is
a mere appendage."*

— Sherlock Holmes

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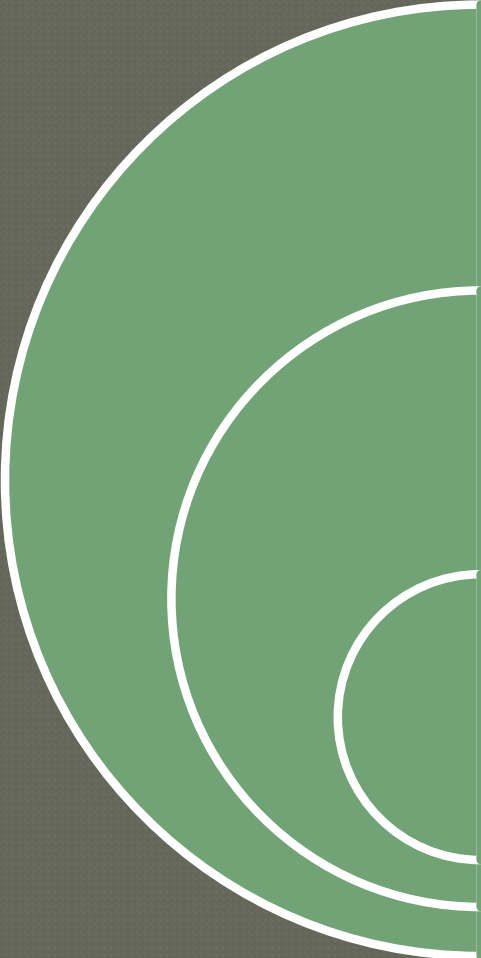
Mirror neurons and Sports

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- All values are imbibed through Imitation
- Mirror neuron System helps in Imitation





Empathy Neurons,

Dalai Lama Neurons

Gandhi Neurons

Values imbibed by watching teachers action



- ◎ Teachers are role model for students
- ◎ Students follow the teacher but the way he behaves and not the way he talks

Creating Vocabulary of values and Ethics

Individual Values

Family Values

Society Values

Values attributed to Religion

National values

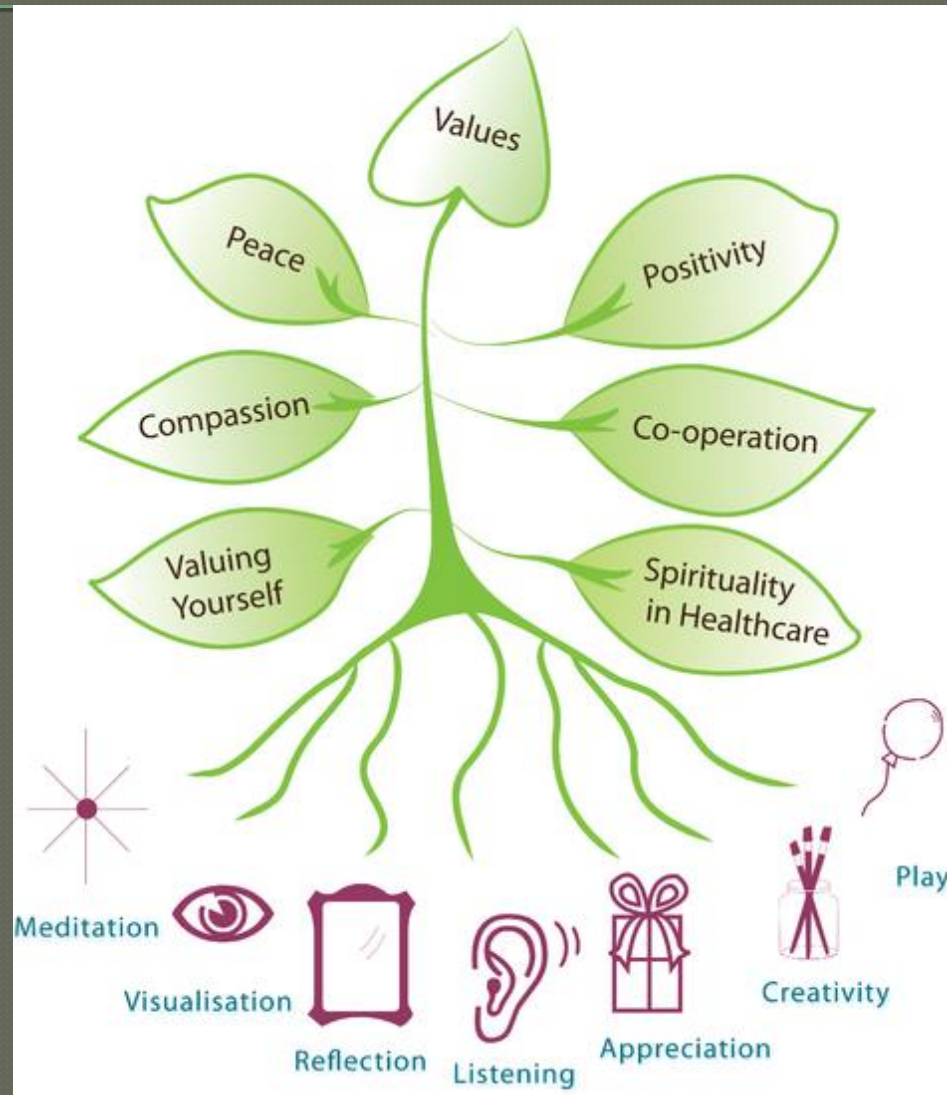
Modified
suitably
By Democracy,
Conscientiously
but
Acceptable
to leadership

for Geography,
Nation,
Religion,
Faculty
Curriculum
, Level of Education etc

Traumatic DE idealization

- Role models are known to shape the values, attitudes & ethics of medical trainees (moral exemplars)
- Model ethical principles through their pedagogy
- Creating environment fosters ethical clinical practice

Values in healthcare



What is sport ethics?

- Sports ethics is the use of moral values and principles to judge conduct relating to sports activities. It involves evaluating the soundness of the intentions and decisions of people and organizations engaged in sports-related endeavors. In a less academic sense, sports ethics refers to the moral guidelines that are inferred from words like "sportsmanship" and "fair play." —THE SPORTS ETHICS INSTITUTE

SPORTSMANSHIP AND ITS VALUES

- Sportsmanship is a matter of being good and doing right in sports.
- Sportsmanship looks like
- Playing fair
- Respecting the judgments of officials
- Treating opponents with respect

What is Sportsmanship?

- "fair play, respect for opponents, and polite behavior by someone who is competing in a sport or other competition"
- My definition: Players, opponents, coaches and officials treating each other with respect.

Sportsmanship at Maximum

LIVE & FREE HD

ITF

Fly Emirates

hopman cup

#hopmancup

MATCH TIME

0:34

Das Auto.

Das Auto.

SOC 5 0

HEW 4 30

FOREHAND SPEEDS (KM/H)	AVERAGE	FASTEST
SOCK	118	163
HEWITT	114	145

Ethics in sport

- Ethics –set of values
- Historically sport has been championed as the carrier of all things moral and ethical (playing fields of Eton etc etc)
- Sport can reflect and display moral and ethical behaviour
- The competitive nature of sport means that there are regular conflicts of ethics and morals

PRINCIPLES FOR AN ETHICAL FRAMEWORK FOR SPORT

- Respect
- Basic justice and fairness
- Refusing to take unfair advantage
- Willing compliance with laws and rules
- Freedom to enjoy and flourish
- Harm prevention
- Impartiality and objectivity
- Trustworthiness and honesty
- Transparency
- Avoiding potential or apparent conflict of interest
- Due diligence
- Duty of care

MAJOR ETHICAL ISSUES IN SPORT

Major issues are

- Coaches having inappropriate relationships with players
- Athletes purchasing steroids and selling them to teammates.
- Corrupt officials fixing competitions.



CONCLUSION

The conclusion drawn from this report is that

Participation is more important than victory

Ethics is an integral part of sport.

Win with dignity and lose with dignity.

conclusion

- Sportsman are role models/heros/icons for society today
- If they follow the values and show them publicly, then society at large will follow
- Common man will start following these values in day to day life
- These values will automatically come in Education
- Society will become a society that values value
- Nation will Ethical nation