Imagery

Yannis Theodorakis

Imagination is more important than knowledge. Knowledge is limited. (Albert Einstein)

Topics

- Definitions
- What the athletes says
- Theory
- Relevant studies
- The where the when and how of imagery
- Practical implications
- Next studies in the area
- https://www.youtube.com/watch?v=F1gqy5KJhww&feature=emb_logo

Rosie Maclennan: gold medal in trampoline, London and Rio

Personal communication: main focus point: the cross of the trampoline, 40 min from trial to trial, imagery, 2=59
https://www.youtube.com/watch?v=xh4ohmllf3o
https://www.youtube.com/watch?v=e9h0509uad8

Can you imagine running?
Can you imagine a high jump?

- https://www.youtube.com/watch?v=EVH2qOwZd18
- Haile Gebrselassie Running in Slow Motion (Barefoot & Shod)
- https://www.youtube.com/watch?v=L3s7z8DXVwo
- Observations on good running technique with Olympian Victoria Mitchell
- https://www.youtube.com/watch?v=EVH2qOwZd18&spfreload=10

- https://www.youtube.com/watch?v=QkbZmpdTuls
- **Στο βίντεο αυτό βλέπουμε μια αθλήτρια του ύψους (Allesia Trost, Ιταλία), η οποία φαντάζεται νοερά το άλμα της λίγο πριν ξεκινήσει την προσπάθεια. Ένα άλμα στα 2 μέτρα. Τη νοερή της αυτή προσπάθεια τη συνδέει και με μια συγκεκριμένη σκέψη.**
  https://www.youtube.com/watch?v=fDb7PnK4kQo
- **Κλείστε τα μάτια σας και προσπαθήστε να φαντασθείτε το ίδιο. Είναι εύκολο;**

Nike football imagery

- •**Visualisation** (https://www.youtube.com/watch?v=SVxoZj8DGWY)


RONALDINHO
10
MAX

Ronaldinho,
one of the world's best footballers, described his use of imagery before the World Cup in 2006
New *York Times Sports Magazine:*

- *When I train, one of the things I concentrate on is creating a mental picture of how best to deliver that ball to a team-mate, preferably leaving him alone in front of the goalkeeper. So what I do, always before a game, always, every night and every day, is try and think up things, **imagine plays**, which no one else will have thought of, and to do so always bearing in mind the particular strengths of each team-mate to whom I am passing the ball.*

Ronaldinho,

- ***When I construct those plays in my mind I take into account whether one team-mate likes to receive the ball at his feet, or ahead of him; if he is good with his head, and how he prefers to head the ball; if he is stronger on his right or his left foot. That is my job. That is what I do. I imagine the game.***

Definitions

- **Imagery is an experience that mimics real experience, and involves using a combination of different sensory modalities in the absence of actual perception.**
- **We can be aware of 'seeing' an image, feeling movements as an image, or experiencing an image of smell, taste or sounds without experiencing the real thing.**

- ***Cumming, J., & Ramse, R. (2009). I*magery interventions in sport. In S. Mellalieu & S., Hanton. Advances in Applied Sport Psychology: A review. New York. Routledge.**

definition

- **Imagery is an experience similar to a sensory experience (seeing, feeling, hearing), but arising in the absence of the usual external stimuli.** **(Martens, 1987).**
- **Individuals are self-aware and conscious during the imagery experience.**
- **Imagery is NOT dreaming.**
- **The individual is awake and conscious when imaging.**

Through imagery

- you can:
- recreate previous positive experiences
- or picture new events to prepare yourself mentally for performance

- **1. Descriptive research suggests that imagery is frequently used by the best athletes.**
- **Canadian athletes who participated in the 1984 Olympic Games, 99% reported using imagery. During the training they engaged in systematic imagery**
- **At least once a day,**
- **4 days per week,**
- **For about 12 minutes each time.**
- **2. Imagery techniques are regularly used by 100% of consultants, 90% of athletes, and 94% of coaches sampled (Jowdy et al.,1989).**

Experimental findings

- suggest that imagery is an effective means of improving performance,
- But is less effective than physical practice.
- Researchers have found
- Significant improvements to performance and psychological factors such as the interpretations of the symptoms associated with competition anxiety.

Experimental findings

- **Performance has been less frequently measured when imagery is the only mental skill delivered in an intervention.**
- **The majority of these studies have instead focused on the improvements found to self-confidence.**

Chris Evert
a famous tennis player

- ***"Before I play a match, I try to carefully rehearse what is likely to happen and how I will react in certain situations. I visualize myself playing typical points based on my opponent's style of play. I see myself hitting crisp, deep shots from the baseline and coming to the net if I get a weak return.***
- ***This helps me mentally prepare for a match, and I feel like I've already played the match before I even walk on the court."***

Mexico 1968
Bob Beamon

- **When I was in the air, I was thinking like a bird flying above cities and mountains.**

Imagery serves five main functions:

Hall, Mack, Paivio, and Hausenblas (1998) concluded

- ***(a) cognitive specific (specific sport skills),***
- ***(b) cognitive general (strategies related to a competitive event),***
- ***(c) motivational specific (specific goals and goal-oriented behavior),***
- ***(d) motivational general-arousal (*feelings of relaxation, stress, anxiety, and arousal),***
- **(e) motivational general mastery (self-confidence, effective coping, mental toughness, focus, and control).**
- **The relevant instrument is:**
- **Sport Imagery Questionnaire (SIQ),**

Imagery types

- **cognitive specific: imagery of sport skills or rehabilitation exercises (e.g. running style, penalty flick in field hockey).**
- **cognitive general: imagery of strategies, game plans and routines (e.g. man-to-man defence, give-and-go offence, pre-shot routine).**
- **motivational specific: imagery of specific goals and goal-oriented behaviour (e.g. achieving a personal best, winning a medal).**
- **motivational general arousal: imagery of somatic and emotional experiences (e.g. stress, arousal, anxiety and excitement).**
- **motivational general mastery: imagery of coping and mastering challenging situation (e.g. staying focused and positive after making an error, being confident in an important competition)**

Playing with confidence in youth soccer players,

Munroe-Chandler, K., Hall, C., Fishburne, G. (2008). The relationship between imagery use and self-confidence and self-efficacy *Journal of Sports Sciences*

- **Analyses found that Motivational General-Mastery (MG-M) imagery was a significant predictor of self-confidence and self-efficacy in both recreational and competitive youth soccer players.**
- **The findings suggest that if a youth athlete, regardless of competitive level, wants to increase his/her self-confidence or self-efficacy through the use of imagery, the MG-M function should be emphasized.**

Imagery Type

Sanna M. Nordin and Jennifer Cumming. The Sport Psychologist, 2005, 19, 1-17

- **Seventy-five novice dart throwers were randomly allocated to one of three conditions: (a) facilitative imagery, (b) debilitative imagery, or (c) control. After 2 imagery interventions, the debilitative imagery group rated their self-efficacy significantly lower than the facilitative group and performed significantly worse than either the facilitative group or the control group. Efficacy ratings remained constant across trials for the facilitative group, but decreased significantly for both the control group *and the debilitative group. Performance remained constant for the facilitative and the control groups but decreased significantly for the debilitative group.***
- ***Results indicate that both CS and MG-M imagery can affect self-efficacy and performance.***

Elite and Novice Athletes' Imagery Use in Open and Closed Sports

Arvinen-Barrow, M., Weigand, D. A., Thomas, S., Hemmings, B., Walley, M. (2007).. *Journal of Applied Sport Psychology, 19,* 93-104.

- ***MG-M was the most used imagery type, regardless of competitive level and skill-type*.**

Healing reasons, etc.

- *have also emerged as a function in the injury-rehabilitation literature*
- ***Imagery to aid in the healing process, for pain management and the prevention of injury.***

- ***Artistic reasons for using imagery may be to communicate with one's audience, to add meaning, to enhance the quality of one's movements and to choreograph a sequence or routine***

internal or external

- **Internal imagery is from the perspective of the imager. The athlete experience what they would see, hear, feel, smell, and taste if they were actually performing.**
- **External imagery is from the perspective of an observer. The athlete experience what they would see.. If they were observing themselves from outside their body.**
- **Research has shown that performance may be enhanced using either perspective.**

Athletes use imagery for many different reasons

- skill learning and practice,
- strategy development an rehearsal,
- competition preparation,
- familiarization with venues and mental warm-ups, mental skill development and refinement,
- coping with various sport stressors or obstacles, such as injuries, heavy training, and distractions

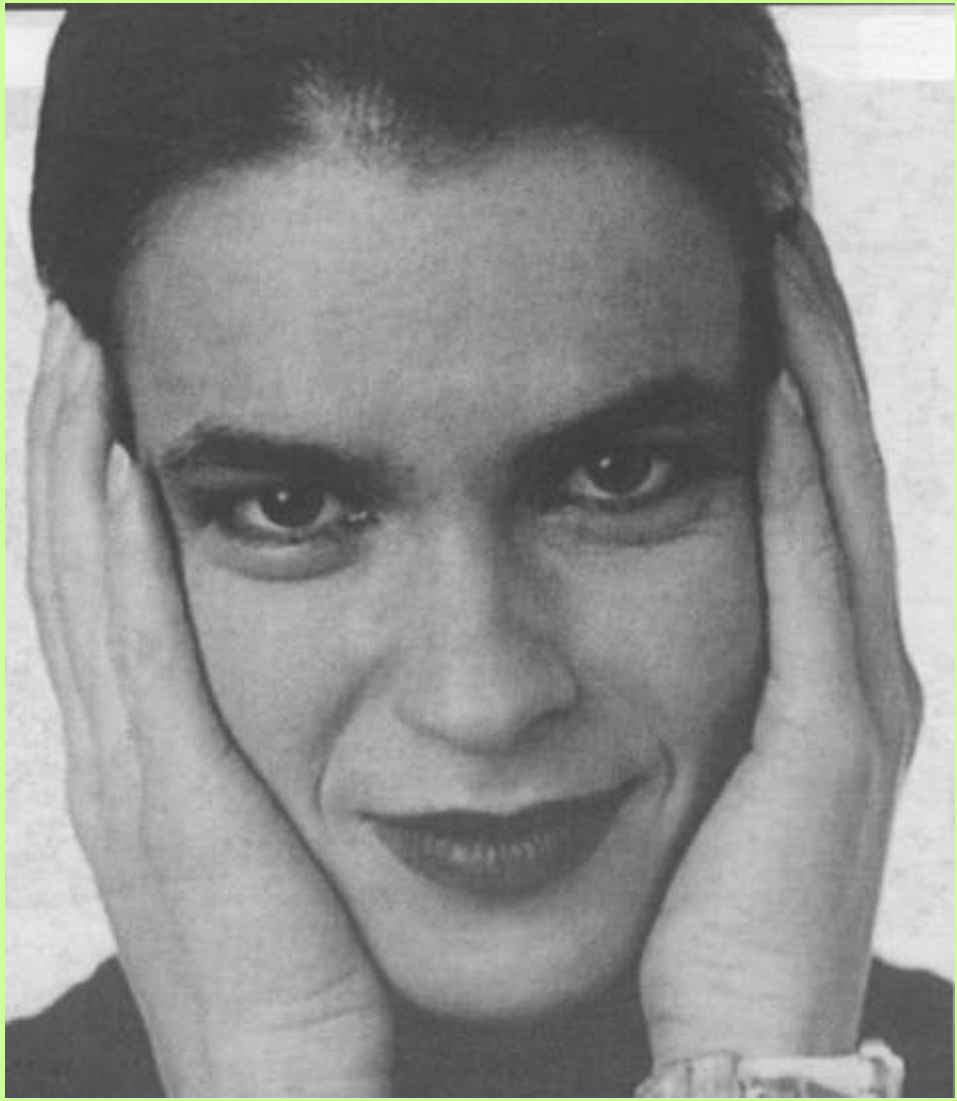
Imagery outcomes/ uses of imagery

- **Imagery has been shown to be effective in enhancing**

- **Improve concentration**
- **Build confidence**
- **Control emotions and anxiety/**
- **In changing athletes perceptions of anxiety**
- **Acquire and practice sport skills**
- **Acquire and practice strategy**
- **Copy with pain and injury**
- **Solve problems**
- **motivation,**
- **visual search abilities of athletes during competition.**

Katarina Witt

- **Νιώσατε ποτέ θεός σε όλη τη μακρόχρονη καριέρα σας;**
- **Άγγελος ένοιωσα... Και πολλές φορές ουράνιο σώμα. Άλλες φορές ένοιωσα σαν ψάρι. Ο τρόπος που γλιστράει ένας αθλητής πάνω στον πάγο είναι ο τρόπος που γλιστράει στο νερό το ψάρι./**
- **Video kim yu na**



Changes in Muscular Activity While Imagining Weight Lifting… Bakker et al., 1996

- Twenty-two male and 17 female students participated in the study. During the imaginary lifting of the weights, the electromyographical activity (EMG) of both biceps brachii muscles were assessed. When response propositions were emphasized In the script, imaginary weight lifting resulted in greater muscle activity than when stimulus propositions were emphasized. During imagined lifting, EMG activity of the active arm was greater than that of the passive arm. In addition, in the active arm, a significant difference in EMG activity was found between 9 kg and 4.5 kg.

imagery exercise

https://youtu.be/eCsuBIYYrIA
Video 5.2 imagery on lifting 1 kg

- *I would like you to imagine (visualize) the environment we are in here. Maybe it is easier to do so by closing your eyes. Attempt to feel (see) yourself and imagine that you are (see yourself)* ***holding 1 Kg in your right hand.*** *Now, feel (see) yourself (to raise your hand up) lifting 1 Kg. Now, feel (see) yourself bringing the 1 Kg back to the starting position. You will hear the next tone, and again, feel (see) yourself lifting the 1 Kg. You will execute the movement that way, just as you did before when you made real movements. Attempt to feel (see) yourself executing the movements all the time, but do not make real movements. Just feel (watch) yourself lifting the 1 Kg.*

Theoretical explanations

- **Explanations for how imagery facilitates the performance and self-perceptions of athletes include**

- **Cognitive explanations focus on information processing and how information is acquired, stored, retrieved, and used in the brain.**

- **Bioinformational theory has been a popular cognitive theoretical explanation for how imagery enhances sport performance, due to its intuitive appeal and pragmatic implications for using imagery to create mental blueprints (προσχέδια) for perfect responses (Vealey, 2005).**

An analytical framework (Paivio,1985)

- ***He suggested that***
- ***Mental imagery might influence behavior on a general or a specific level through both cognitive (e.g., skill and strategy rehearsal) and motivational (e.g., self-confidence, arousal, goal-setting) mechanisms.***

Symbolic learning

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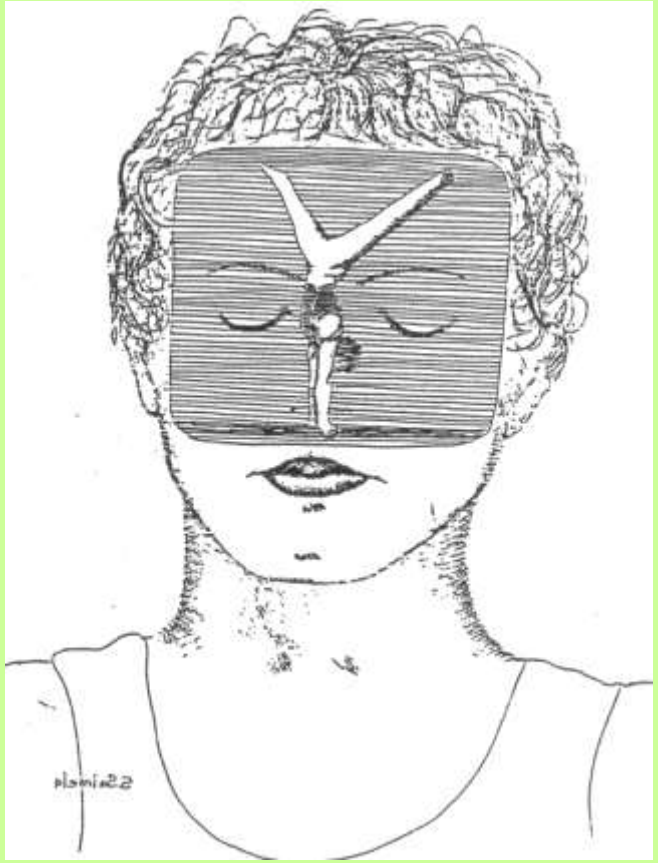


Lang (1985) (bioinformational)

- Σύμφωνα με την θεωρία όλη η γνώση απεικονίζεται στην μνήμη ως μονάδες πληροφοριών που ονομάζονται προτάσεις και χωρίζονται σε 3 κατηγορίες.
- Των ερεθισμάτων του εξωτερικού περιβάλλοντος,
- των αντιδράσεων του ατόμου στα ερεθίσματα αυτά,
- και του νοήματος των γεγονότων αυτών στο άτομο.
- Οι πληροφορίες από όλες αυτές τις κατηγορίες των προτάσεων σχηματίζουν ένα δίκτυο, και όταν ένας κρίσιμος αριθμός συμπληρώνεται, όλο το δίκτυο ενεργοποιείται.
- Μια εικόνα δεν αποτελείται μόνο από ένα ερέθισμα στον εγκέφαλο του ατόμου με βάση του οποίου το άτομο αντιδρά, αλλά οι αντιδράσεις αυτές έχουν σχεδιασθεί να παράγουν συγκεκριμένη φυσιολογική δραστηριότητα. Σύμφωνα με τη θεωρία εικόνες που περιλαμβάνουν και φυσιολογικές αντιδράσεις είναι πιο αποτελεσματικές στην διαδικασία αλλαγών της συμπεριφοράς (Smith & Collins, 2004).

Theoretical explanation

- **Psychological state explanations**
- **focus on the motivational function of imagery, in helping athletes feel more confident, optimally aroused, and clearly focused for competition.**
- **Neurophysiological explanations**
- **focus on the premise of functional equivalence, meaning that imagery and actual movement recruit common structures and processes in the brain, with the only difference being that during imagery the performance skill is not executed**

Research findings in great number of sports.

- **Mental retardation**
- **Novice and experienced soccer players**
- **Modern dance**
- **Injury rehabilitation**
- **Basketball,**
- **tennis,**
- **archery,**
- **diving**

Etc.

Effects of Mental Imagery on Muscular Strength in Healthy and Patient Participants: A Systematic Review.

Journal of Sports Science and Medicine (2016) 15, 434-450
http://www.jssm.org

Slimani, M., Tod, D., Chaabene, H., Miarka, B., & Chamari, K. (2016).

- **The combination of mental imagery and physical practice is more efficient than, or at least comparable to, physical execution with respect to strength performance.**
- **Advantageous effects of internal imagery for strength performance compared with external imagery.**
- **Mental imagery with muscular activity was higher in active than passive muscles, and imagining "lifting a heavy object" resulted in more EMG activity compared with imagining "lifting a lighter object".**
- **Thus, in samples of students, novices, or Youth male and female athletes, Internal Mental imagery Has a greater effect on Muscle Strength Than External Mental Imagery does. Imagery ability, motivation, and self-efficacy have been shown to be the variables mediating the effect of mental imagery on strength performance. Finally, the greater effects of internal imagery than those of external imagery could be explained in terms of neural adaptations, stronger brain activation, higher muscle excitation, greater somatic and sensorimotor activation and physiological responses such as blood pressure, heart rate, and respiration rate**

Online interventions in teaching psychological skills

- **Three psychological skills were used; imagery, self-talk, and if-then planning, with each skill directed to one of four different foci: outcome goal, process goal, instruction, or arousal-control.**
- **Results revealed performance improved following practice with incremental effects for imagery-outcome, imagery-process, and self-talk-outcome and self-talk-process over the control group, with the same interventions increasing the intensity of effort invested, arousal and pleasant emotion.**
- **Results offer support for the utility of online interventions in teaching psychological skills and suggest brief interventions that focus on increasing motivation, increased arousal, effort invested, and pleasant emotions were the most effective.**

- **Lane AM, Totterdell P, MacDonald I, Devonport TJ, Friesen AP, Beedie CJ, Stanley D and Nevill A (2016) Brief Online Training Enhances Competitive Performance: Findings of the BBC Lab UK Psychological Skills Intervention Study. Front. Psychol. 7:413. doi: 10.3389/fpsyg.2016.00413**

cognitive vs motivational

Imagery for soccer players

- **Cognitive strategies, particularly imagery, appear to improve sports performance in soccer players. Regarding imagery, the combination**
- **of two different types of cognitive imagery training (i.e., cognitive general and cognitive specific) has a positive influence on soccer performance during training, whereas motivational imagery (i.e., motivational general-arousal, motivational general-mastery and motivational specific) enhance competition**
- **performance. Younger soccer players employ cognitive general and cognitive specific imagery techniques to a greater extent than older soccer players. Combined cognitive training strategies were more beneficial than a single cognitive strategy relative to motor skills enhancement in elite (particularly**
- **midfielders) and amateur (i.e., when practicing complex and specific soccer skills in precompetitive period) soccer players.**

- **Slimani, M., Bragazzi, N., Tod, D., Dellal, A., Hue, O., Cheour, F., Taylor, L., & Chamari, K. (2016): Do cognitive training strategies improve motor and positive psychological skills development in soccer players? Insights from a systematic review, *Journal of Sports Sciences,* DOI: 10.1080/02640414.2016.1254809.**

Online interventions in teaching psychological skills

TABLE 1 | Intervention and examples of intervention scripts.

Psychological skill:	Focus of intervention			
	Process	**Outcome**	**Arousal-control**	**Instruction**
Self-talk	"I can react quicker this time"	"I can beat my best score"	"I will stay calm"	"I will focus completely on each number I need to find"
Imagery	"I want you to picture yourself playing the game, knowing that you can react quicker than you did last time."	"I want to you to picture yourself playing the game, and imagine beating your best score."	"I want to you to picture yourself sat in front of the computer calmly with no tension in your body."	"See yourself scanning the whole grid to find the next number, moving the pointer back to middle of grid after finding each one."
If-then planning	"IF I start worrying about mistakes, THEN... I will say to myself, "Good performance last time. I can do it again!"'	"IF I can't find the number THEN... I will tell myself that I can beat my best score!"	"IF I find myself holding my breath, THEN ... I will say to myself, 'I will stay focussed!'"	"IF I lose my concentration, THEN ... I will move the pointer to the middle of the grid after each number!"
Control	"You have played the game now. You have to find the numbers and finding them can be challenging. It's a different grid but the challenges will be similar. Spend some time getting mentally ready. Give yourself about 90 s to prepare, before you start the next round."			

Tracey Devonport, Andrew Lane, and Christopher L. Fullerton (2016). Introducing Sport Psychology Interventions: Self-Control Implications. The Sport Psychologist, 2016, 30, 24 -29 http://dx.doi.org/10.1123/tsp.2014-0120

An example of imagery-physical training program

https://www.youtube.com/watch?v=MDL8739aFUw

- Imagery-condition participants were provided with an imagery script that included both visual and kinesthetic elements of the front crawl tumble turn. The following illustrative sentence from the script describes the initial stages in the execution of a tumble turn:
- Feel/see your dominant arm, which is outstretched in front of you sweep across your body; first downward through the water, then inwards and upwards toward your body. While you are pulling down through the water with your dominant hand feel/see your head simultaneously drive downward.
- Participants were instructed to use the imagery script and verbal feedback provided to imagine performing the tumble turn correctly before each execution of the turn.
- Therefore, for imagery-condition participants, the sequence of events was as follows: perform imagery, perform skill, receive feedback, perform imagery, perform skill, and so on.

Applications for professionals

- Relaxation
- The place, the time
- Specific goals
- The log
- Evaluation
- Daily program

When?

- **Before, during or after the training session**
- **15 min before the event**
- **(Alex Baumann)**

- **How often?**
- **10-15 min of quality imagery every day, at least.**
- **The much, the better**
- ***“I’ve been doing imagery of the Olympics for about four years, but I started this course last February and have run it hundreds of times in my mind” downhill skiing racing***

Olympic medalist Alex Bauman described timing his imagery of swimming races:

- *The best way I have learned to prepare mentally for competitions is to visualize the race in my mind and to put down a split time. The splits I use in my imagery are determined by my coach and myself, for each part of the race. For example, in the 200 individual medley, splits are made up for each 50 metres because after 50 metres the stroke changes. These splits are based on training times and what we feel I'm capable of doing. In my imagery I concentrate on attaining the splits I have set out to do.*
- (Orlick, 2016. In pursuit of excellence

Using imagery at critical moments

- **In regular bases before, during, and after training or competition**
- **Instant preview before competition**
- **Preview during performance or competition**
- **Instant review during competition**
- **Performance review after competition**

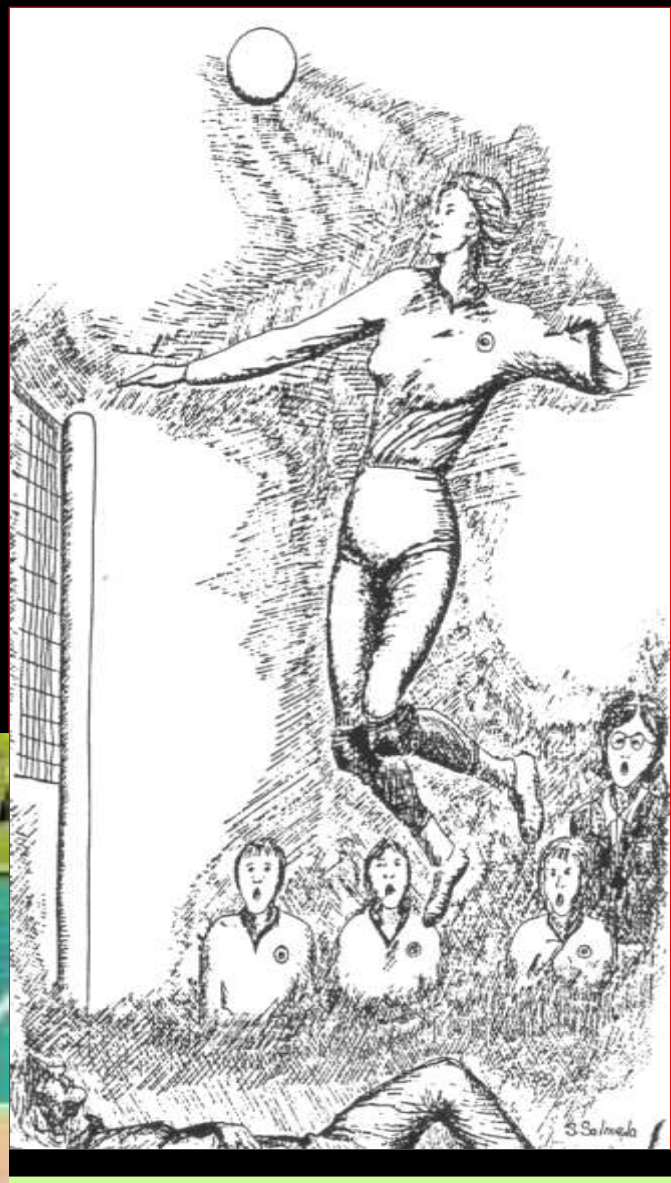
Implications

Imagery….
Exercise

build confidence and preparation for competition

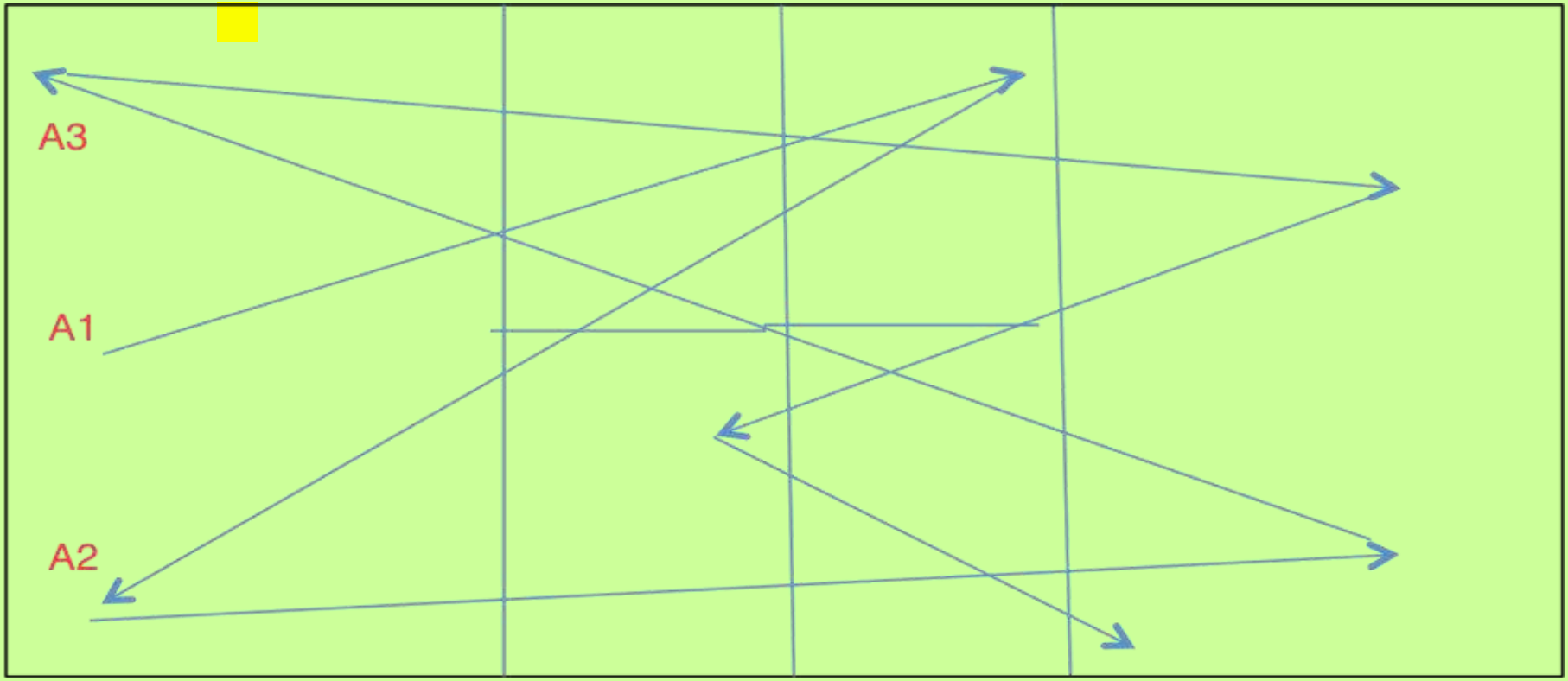
imagery

Ο αθλητής φαντάζεται ένα πλήρες σενάριο



Video 5.1 AN IMAGERY EXERCISE ON TENNIS.

- https://youtu.be/vlvTQH_tBOw



How, developing an imagery program

- *Relaxation*
- *Vividness*
- *Controllability (emotions, the time, the performance..*
- *Imagery evaluation*
- *Proper setting*
- *Relaxed concentration*
- *Realistic expectations*
- *Vivid and controllable images*
- *Positive focus*

- When to use imagery in sports
- Munroe, K. J., Giacobbi, P. R., Hall, C., & Weinberg, R. (2000). The four w.s
- 119.137.

- ***Before and after the practice***
- ***Before and after the competition***
- ***During breaks and action***
- ***During personal time***
- ***When recovering from injury***

IMAGERY FOR EXERCISE PARTICIPANTS

- JOURNAL OF APPLIED SPORT PSYCHOLOGY, 15: 160.175, 2003
- Even More About Exercise Imagery: A Grounded Theory of Exercise
- Imagery PETER R. GIACOBBI, JR., HEATHER A. HAUSENBLAS, ELIZABETH A. FALLON, CRAIG A. HALL.
- This study sought to determine the content and
- function that regular exercisers ascribe to their use of exercise imagery. Semi-structured interviews were conducted with 16 female participants. Using the analytic strategies of grounded theory, a research team performed inductive analysis that
- revealed the following eight higher order themes:
- exercise technique,
- aerobic routines,
- exercise context,
- apparence images,
- competitive outcomes,
- fitness/health outcomes,
- emotions/feelings associated with exercise,
- and exercise self-efficacy.
- making progress towards important goals
- related to their physical appearance.
- Appearance and fitness outcome imagery had important
- implications for sustaining their exercise behavior..

- **An imagery exercise A script**
- ***It is a crisp autumn day in Trikala and you are engaged in a training run, down a street close to your home. You feel the cold bite of air to your nose and throat as you breathe in large gulps of air. You are running easily and smoothly, but you feel pleasantly tired, and can feel your heart pounding in your chest. ..As you run you can feel a warm sweat on your body.***
- ***Weinberg & Gould, 1999)***

- **Music in Sport and Exercise : An Update on Research and Application**
- **Costas Karageorghis and David-Lee Priest**
- **Scientific inquiry has revealed five key ways in which music can influence preparation and competitive performances: dissociation, arousal regulation, synchronization, acquisition of motor skills, and attainment of flow.**
- **Pre-task music has been shown to optimise arousal, facilitate task-relevant imagery and improve performance in simple motoric tasks. During repetitive, endurance-type activities, self-selected, motivational and stimulative music has been shown to enhance affect, reduce ratings of perceived exertion, improve energy efficiency and lead to increased work output.**

Imagery exercise

- Goal setting and imagery
- Dart throwing 5 trials, and video recording.
- Attending a video with an expert
- Imagery exercise for 5 min the expert and themselfes
- Dart throwing 5 trials

https://www.youtube.com/watch?v=1RZ8Oztk9Zo

Brady Ellison explains archery tournament preparation

- Φαντάζεται πως αντιδρά σε εμπόδια, φαντάζεται τι θα κάνει όταν έχει σκορ 351,352, τι θα κάνει όταν βρέχει, έχει σενάρια, φαντάζεται διάφορα, σκορ σε σχέση με προηγούμενους αγώνες, σε σχέση με το PB, σχεδιάζει σε σχέση με τα trials, τους προηγούμενους αγώνες, προετοιμάζεται νοερά για τα φαγητά της χώρας που θα επισκεφτεί.

https://worldarchery.org/news/178091/brady-ellison-discusses-mental-game-during-ama-nbc-olympics-reddit-1

Brady Ellison discusses mental game during AMA for NBC Olympics on Reddit Chris Wells Twitter 26 February 2020

- Last season was the best of the 31-year-old's career. He won the World Archery Championships and a record fifth Hyundai Archery World Cup Final, broke the 72-arrow 70-metre ranking round world record with 702/700 and returned to the number one spot in the recurve men's world ranking. With a trip to a fourth Olympic Games on the horizon, Brady opened up about the impressive mental approach that has carried him to recent new heights in the sport.

- **Asked how he prepares for major events:**
- ***"A lot! The idea of it, I guess, is that I work every day on my mental games and that prepares for the big shoots."***
- ***"My mental routine is applied to life, not just sport, so I am always trying to be the best I can be at everything. I may shoot 350 physical arrows a day but I shoot 1000s in my head every day."***
- ***"On the range and off the range, I am hardly ever not doing something mentally. It's just how I work and how I get better."***

Summary

- Positive performance imagery
- The best athletes in the world in every sport use imagery to improve performance in training and competition.
- It works with novice athletes as well as elite professionals.
- It takes regular practice, proper instruction, and good effort.
- It is also an effective life skills to enhance Concentration, commitment, confidence, control And quality of life at home, school, work and play, and better control of your life