



Gestures while reporting emotions in sport

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Gestures and Emotions

- Studies about multimodal communication of emotions focused on facial expression more than gestural signals (Ekman, 1982).
- Gestures reveal the intensity of emotions but they don't qualify them (Ekman, Efron, Wallbott, Pelachaud et al.)
- Gestures are mostly studied in relation with language and to understand underlying cognitive processes (McNeill, 1992;2005).

Gestures and thinking

- Knowledge and meanings are represented in memory semantically (or propositionally) and imagistically.
- Language and gestures cooperate to express the minimal global-synthetic nucleus of meaning (“growth point”)
- Gestures vehicle imagistic content (McNeill, 1992).
- Gestures are strictly related to mental imagery (e.g. point of view)

Psychophysiological and sport psychology studies

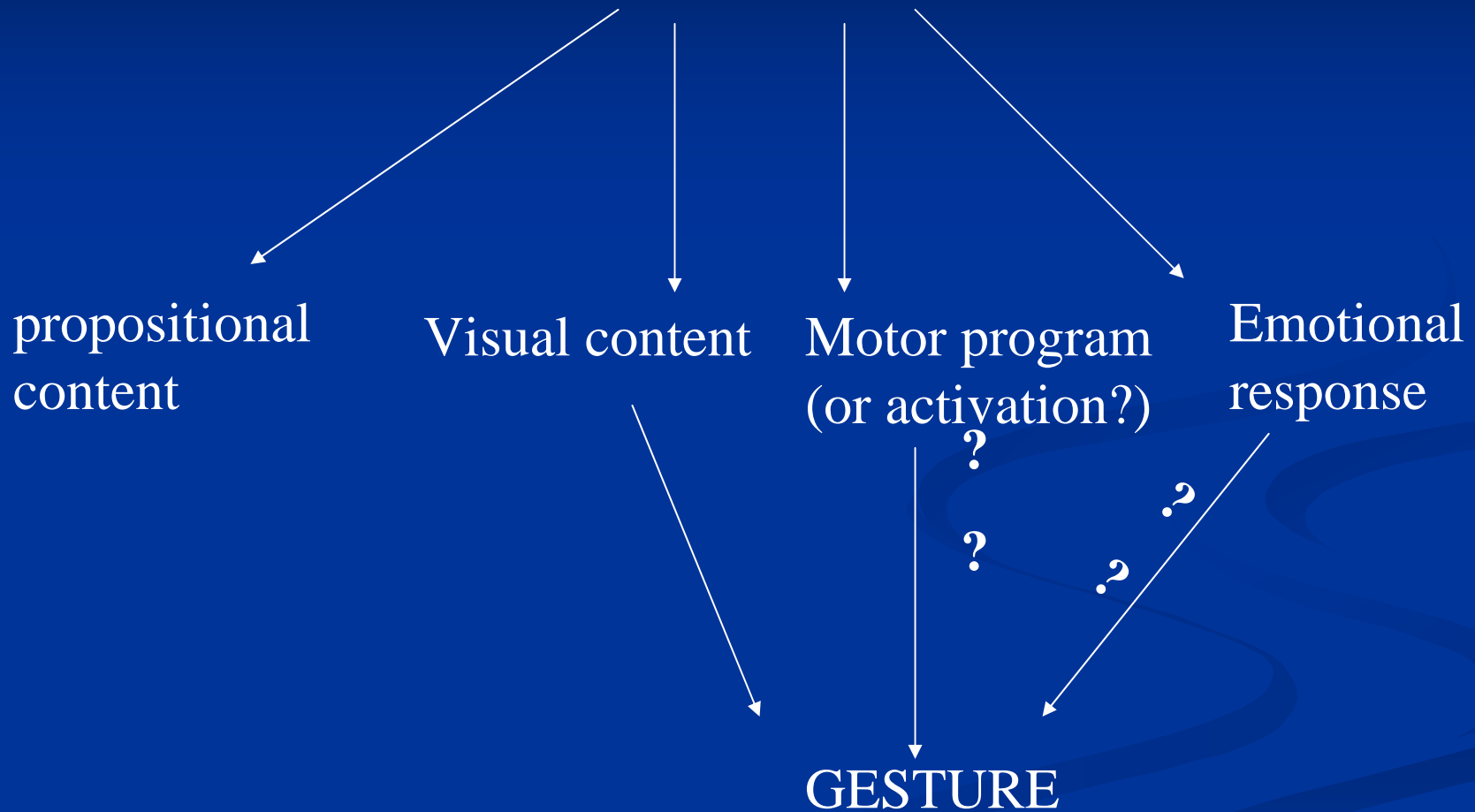
- Studies in mental imagery show that “the image is not a stimulus in the head to which we respond; it is itself an active response process (...); imagery is accompanied by an efferent out-flow appropriate to the content of the image” (Lang, 1979).
- Moreover, a motor program and an emotional response with related somato-visceral activation are included in the image.

A link between multisensorial imagery and gestures: the High jumper example



- Before starting the action, high jumpers close their eyes and image all the sequences of movements from the run-up to the jump
- During this thought they move their arms and hands representing the movement of the run-up or the fluidity and easiness of it
- Finally they do as if to aim the take-off with the whole body

Imagery



When thinking is about an emotional stimulus, what do gestures communicate?

Sport emotions and feelings

- We decided to study the relationship between emotion and gestures in sportive context because:
 1. Sport competitions are a situation in which we can see expressions of many emotions and feelings in different moments (before, during and after competition)
 2. Mental imagery about sport events evokes many emotions and feelings.
- Because of the relationship between imagery and gestures and between imagery and emotions, we want to observe if gestures have some kind of role in the communication of these emotions

Hypothesis

- Mental imagery about a competition, or the recall of it, brings to specific feelings and neuromuscular activation : when we talk about this particular kind of emotional event we use specific (iconic-like?) gestures
- Gestures vehicle not only visual content of *growth point* (or meaning) but they represent feelings and emotions experienced during competition
- Our hypothesis is that when people talk about an experience highly characterized by feelings and emotions, they use gestures to represent iconically the related somatic response.

Emotions in sport

- Cognitive-behaviour approach shows in sport emotion research that quality of performance depends not only from emotions but from the athletes' readings and interpretations of them and from their expectations.
- Hanin (1986) says that unpleasant like pleasant emotions can make optimal performance achievement easier
- However, sports competitions, in particular very successful or unsuccessful ones, represent meaningful events for the athletes and they experience them with a high degree of emotional involvement

Emotions in sport (2)

- During the “flow state” (Csikszentmihalyi, 1993), an athlete experiences particular mental states, emotions and feelings that bring him to a peak performance

Emotions in sport (3)

- When telling about their own best or worst performance athletes show their emotions and reveal related thinking (Butler, 1998)
- Sport psychologists suggest to use mental imagery to increase athletes' involvement in recalling the race.
- It is possible to work on experienced sensations and emotions when remembered.

Emotions while telling of sport
performance:
an empirical research

Goals / hypotheses

- Identify the role of gestures while people talk about emotionally significant events
- Search differences between gestures exhibited in describing an optimal (the best) performance and gestures exhibited describing the worst one.
- Understand if the best and the worst performances evoke different imagery quality and different gestural production, apart from different emotions.
- Investigate the relationship between quality of imagery (rating of vividness degree of visual, tactile and kinesthetic feelings and perspective) and gestures characteristics

Experiment

SAMPLE:

- 30 track and field athletes between 17 and 49 years old, equally distributed for sex, recruited, before or after their training session, from three sports grounds in Rome

Procedure

- Athletes were requested to talk about their own best and worst performances, and to re-live those experiences including the pleasant and unpleasant emotions and physical sensations they felt. Each session was video-recorded.
- Mental imagery techniques were used to assure a perfect recall of the best and worst competitions and to induce athletes to experience those emotions and feelings again.
- During imagery session, each athlete answered four questions:
 1. -the vividness of the images recalled
 2. -the intensity (capacity) of feeling again the muscular movements
 3. - the intensity (capacity) of feeling again the tactile sensations.
 4. -the imagery viewpoint (point of view) (internal, external or mixed) (Murphy, 1990).
- At the end of the imagery session each athlete listed three emotions that characterized the imagined competition.

Verbal	Signal	Meaning		Signal-meaning relation			Expressivity
		Mean.	Mean. Type	Cod./ creat.	Iconic/ arbitrary	Cvpt /Ov pt	
Cooccurrent vb	Signal description	Mean.	Mean. Type	Cod./ creat.	Iconic/ arbitrary	Cvpt /Ov pt	Descr./ express.
“Tension”	Intertwisted fingers, palms downwards	Tension	ISM	cod	motivated non iconic	-	expressive
“wellbeing”	Open hands palms up	Relax	ISM	cod	motivated non iconic	-	expressive
Entered the last 100 meters	Open hand palm left fingers up moves forward fast in J path	Fast movement in J trajectory	IW	creat	iconic	O	-

Results

- We observed the presence of different types of gestures:
 1. **Iconic Gestures** that represent visual elements (track; athletes' movements; etc)
 2. **Gestures** (beats; metaphoric; self-manipulation; etc) that are **not related to the race**
 3. **GESTURES THAT REFER TO EMOTIONS**

Gestures that refer to emotions

- Gestures that **EXPRESS** emotions or feelings
- Gestures that **describe** (or symbolize) emotions
- **Self-manipulation** gestures (non intentional, that reveal actual emotions-not related to the race)
- **Non voluntary** gestures

Expressive gestures

- With this kind of gestures athletes wanted to **reproduce** a state of tension or relax, well-being and easyness (“flow state”).
- These are gestures which directly express the emotion, “showing” its somatic response. It is the bodily part of the emotion

Gestures that describe emotions

- These gestures **represent** emotions or mental states
- Frequently they are symbolic gestures (e.g. concentration) or iconic gestures that represent visual characteristics (e.g. to imitate the heart beat)

Self-manipulation gestures

- These are the gestures that Ekman called “self-adaptors”: they reveal the emotional state of the speaker.
- These signals seem to be directly related to the present emotion or mental state (like anxiety, stress, shyness, etc) and not necessarily related to the content of the telling

Non voluntary gestures

- Many athletes, when talking about a very important moment of the competition, betray their emotions (related to the content of the telling) producing hand gestures or leg movements
- Sometimes gestures show an emotion simply by their particular degree of tension

Cohesive **gestures**

- We also observed that many times the athletes change type of gesture when changing scene or emotional context, and re-use the same type of gesture if they talk again about that scene or emotional context

Sub-parameters of expressivity

- Following Pelachaud et al.(2005), we noticed that the emotion was often expressed only by:
 1. the repetition
 2. the tension of the gesture movement

C-VPT and O-VPT gestures

Many examples of iconic gestures represent visual elements of the competition, e.g.

- the athletes' moving on the track;
- spatial relations between athletes or between athletes and track

- Sometimes athletes use C-VPT gestures by assuming a character viewpoint as if they were re-living the competition
- Sometimes they show O-VPT gestures as if they were seeing the race from an external point of view

Best vs. worst performance

Comparing the best and the worst performances significant differences emerge:

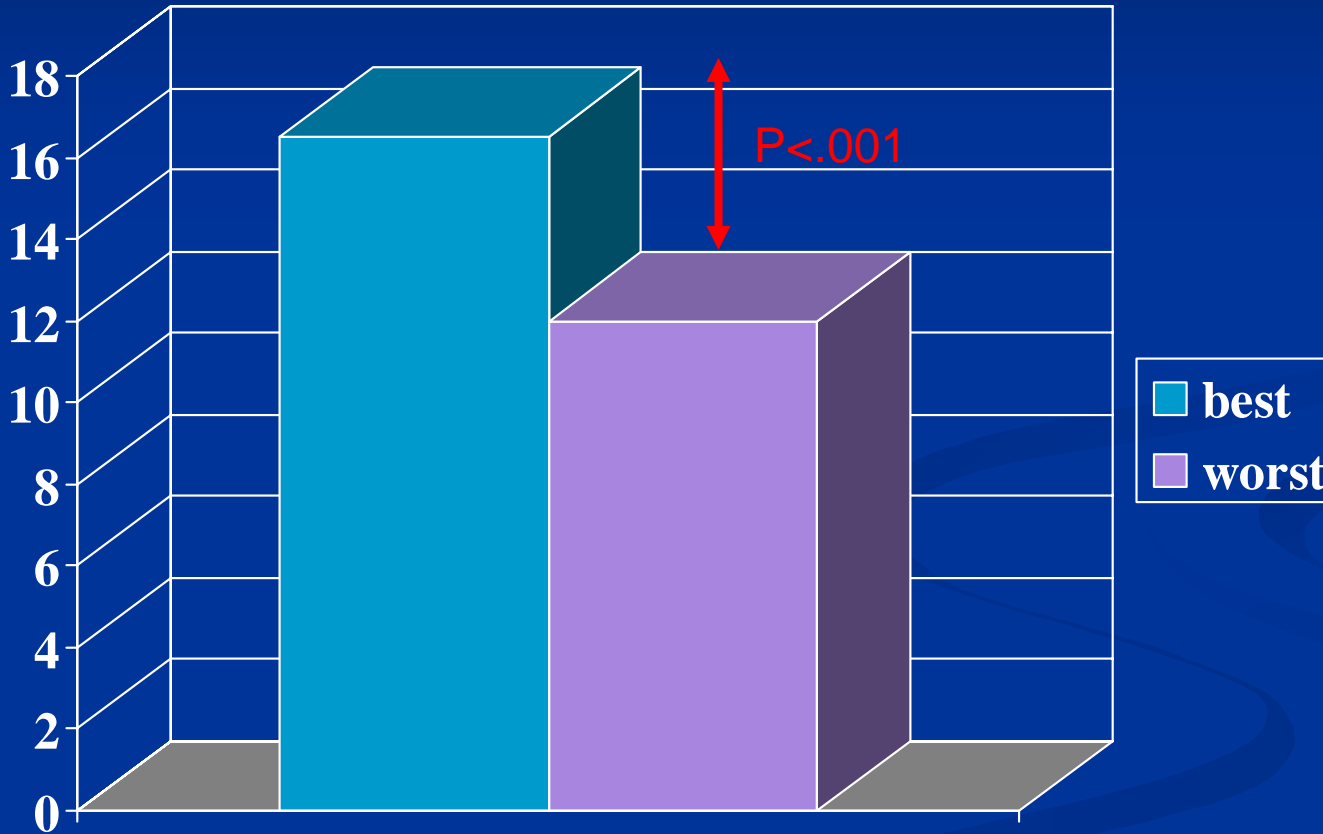
- Total number of gestures per time unit ($p < .001$)
- Percentage of gestures expressing emotions ($p < .005$)
- Percentage of iconics (C-VPT or O-VPT) significantly bigger for the best performance ($p = .002$)

The Percentages of non voluntary gestures are not significantly different in the two tellings

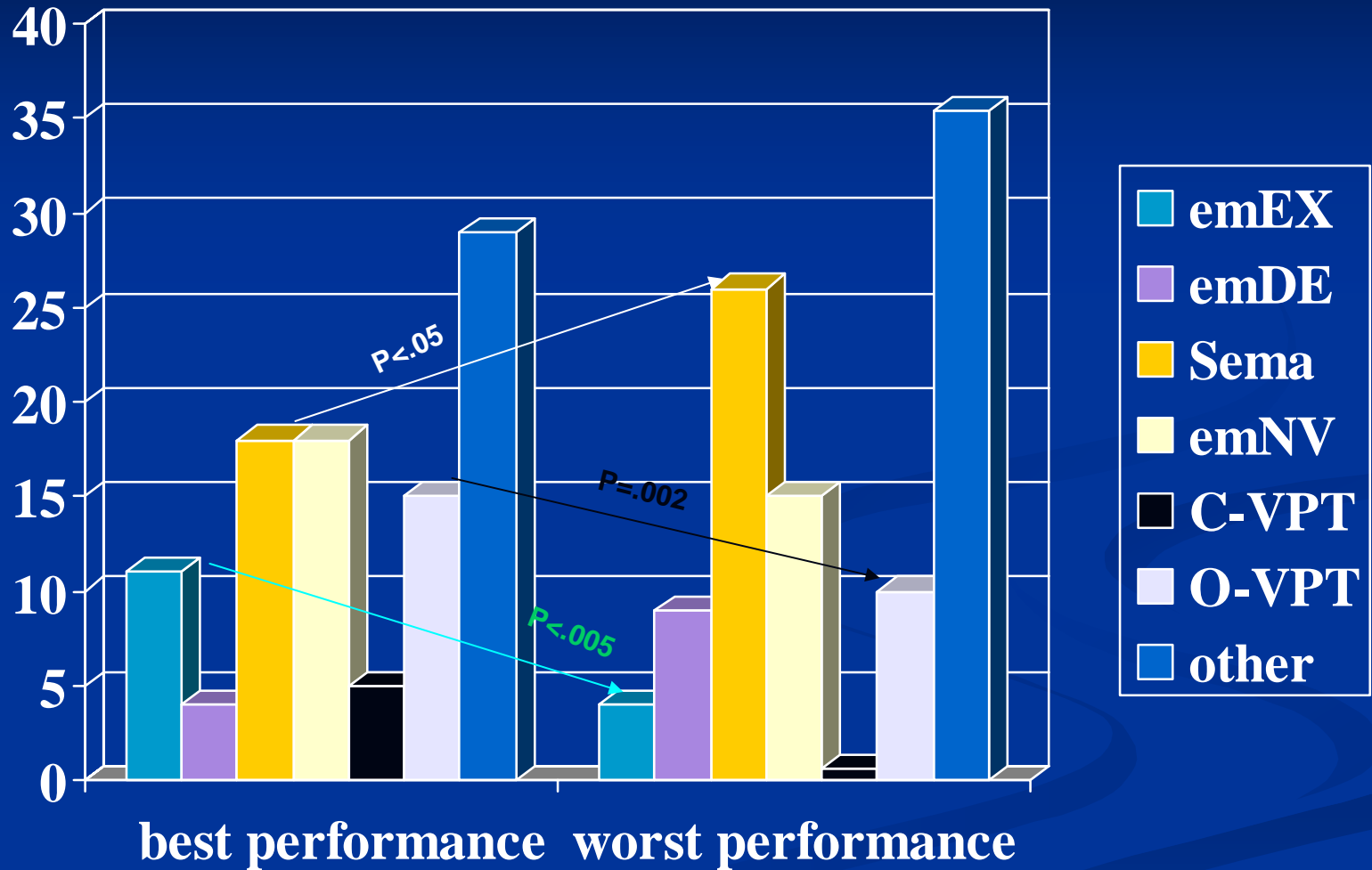
Best vs. worst performance (2)

- The percentage of self-manipulation gestures is significantly higher in the worst race ($p < .05$)
- Gestures that describe emotions are more frequent in telling about worst performance (difference only near significance: $p = .10$)
- Other categories of gestures don't show significant differences in the two groups

Number of gestures per time unit (100sec)



Percentage of the different types of gestures



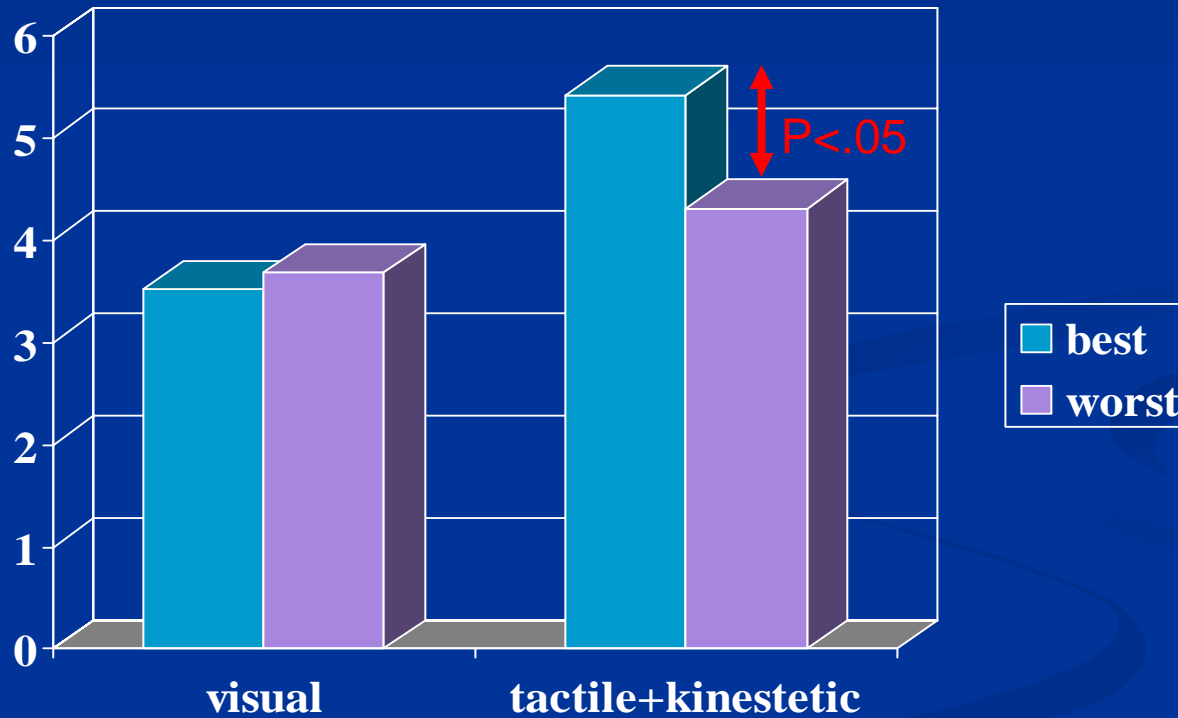
Best vs. worst (3)

- When athletes start to talk about their worst performance they tend to change posture and produce closure gestures (like crossing the arms)

Imagery quality

- The difference between the degree of visual vividness of best and worst performance is not significant
- The quality of kinesthetic and tactile reported feelings is better in good performance imagery ($p < .05$)
- The percentage of Internal viewpoint for best performance imagery is higher than for worst performance (79% vs 47%)

Imagery vividness



Questions and answers

1. Identify the role of gestures while people talk about emotionally significant events
 2. Search differences between gestures exhibited in describing optimal vs. worst performance.
 3. Understand if the best and the worst performances evoke different imagery quality and different gestural production, apart from different emotions.
 4. Investigate the relationship between quality of imagery (vividness of visual, tactile and kinesthetic feelings and perspective)
1. Express emotions; describe emotions;
 2. & 3. More gestures for best performance, specifically more “expressive” and iconic (C/O-vpt) gestures. Closure gestures and self-manipulation gestures more frequent in the worst performance
 4. Kinesthetic and tactile reported feelings seem better in telling about good performance

Discussion (1)

- The best performance is usually told using more gestures, compared to the telling of the worst one; especially used are emotional gestures and in particular expressive ones
- According to this and noticing that also C-vpt and O-vpt are more frequent, we tend to think that athletes relive the best performance with much more intensity
- The great frequency of emotional gestures exhibited during best performance and the quality of kinesthetic and tactile recall suggest the possible role of gesture in expressing the motor-emotional content of the image

Discussion (2)

- Athletes, in telling about best performance, as opposed to worst ones, tend to:
- Use more gestures
- Use more emotional gestures, and in particular expressive gesture
- Frequently use also C-vpt and O-vpt gestures

Discussion (3)

- While telling about best performances, the athletes seem to re-live the performance itself with much more intensity
- This is partly confirmed by more vivid mental imagery
- Athletes telling about best performances tend to have both a higher level of kinesthaetic images and to exhibit more expressive gestures

A possible application in athletes' training

- Is it possible to work on athletes' gestures (besides their mental imagery) to change their readings and interpretation about emotions and their expectations of success/unsucces?