



Workshop: Tactical Creativity in Football

Prof. Dr. Daniel Memmert



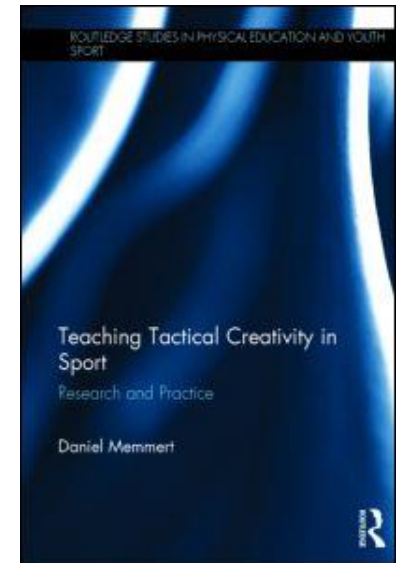
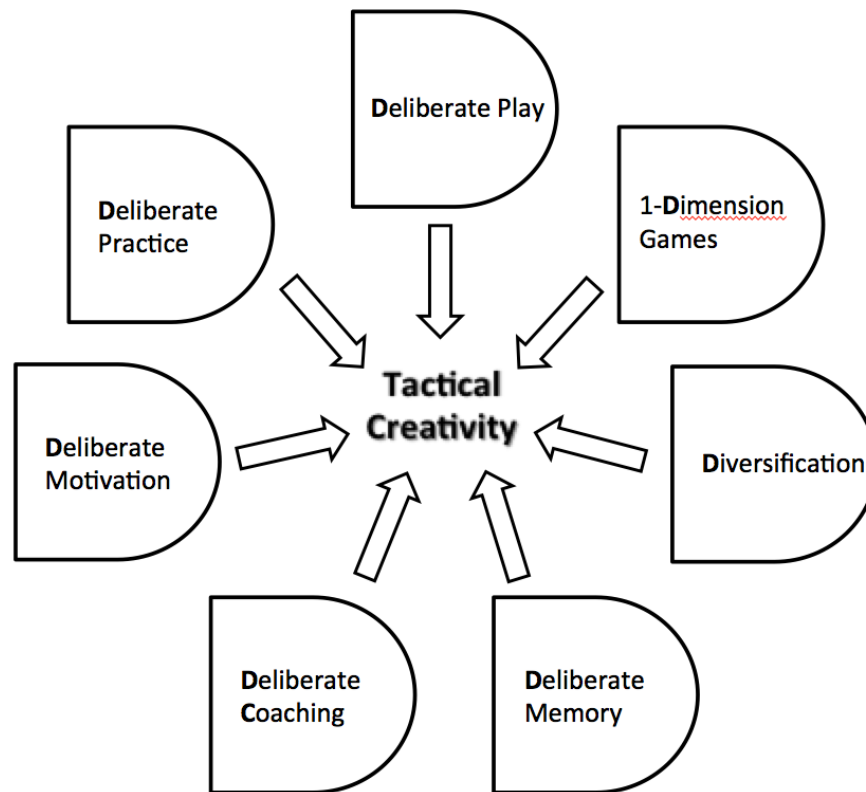
**Deutsche
Sporthochschule Köln**

German Sport University Cologne
Institut für Kognitions- und Sportspielforschung

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Tactical Creativity Approach (TCA) or ... the 7 Ds of fostering creativity



Memmert, 2015

Memmert (2010), In Butler & Griffin (Eds.) *Teaching Games for Understanding*, Human Kinetics

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Deliberate Play

Uninstructed Experimenting!



Deliberate Play

„Already in my grandpa's fotos you can see me with a ball. He let me develop freely. Maybe that's why I became creative... My grandpa always let me play with the ball, never patronized or snubbed me like a teacher, you have to do this or that...”

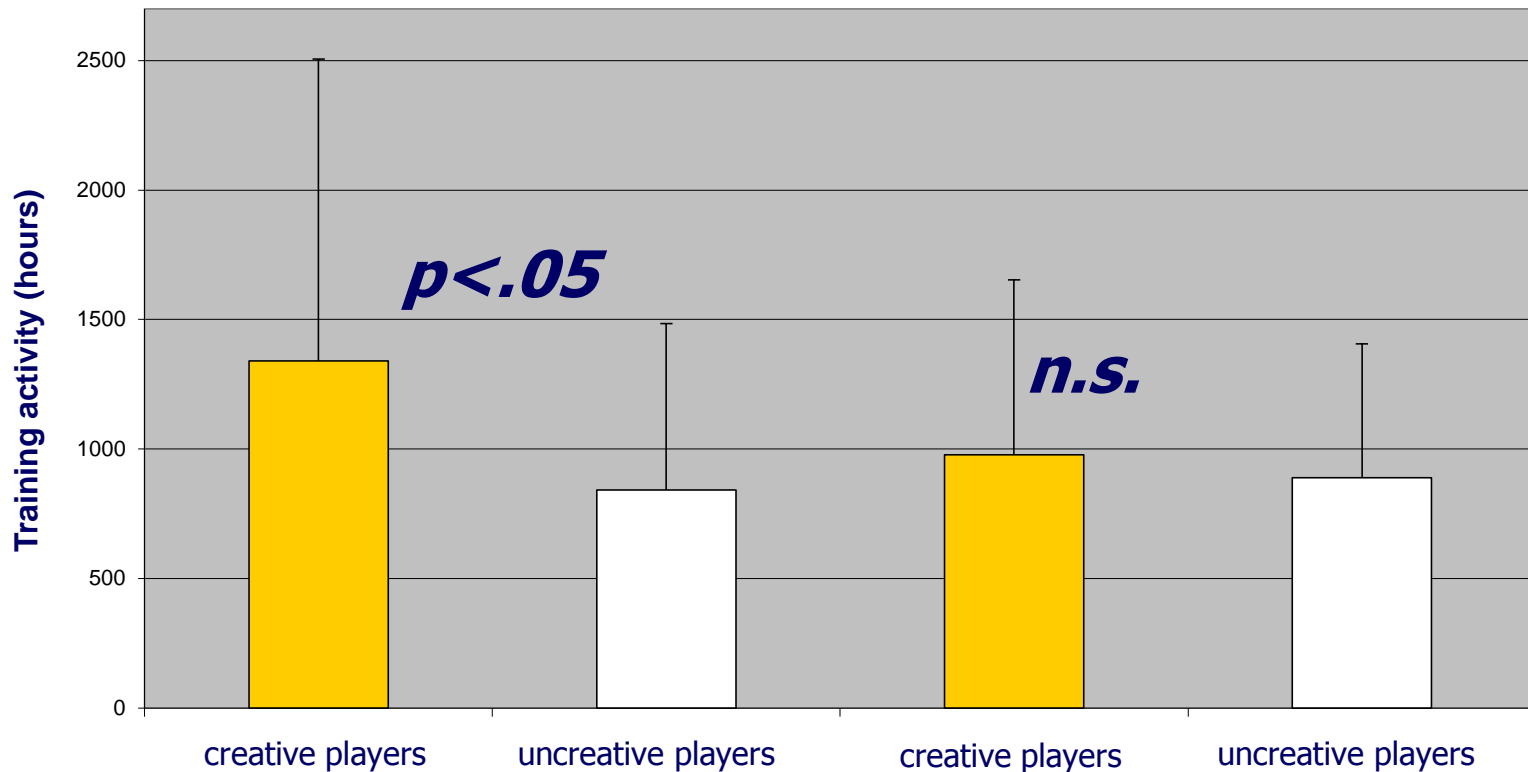
(Hamsen, Greco &
Samulski, 1999)

Movement biography study



Unstructured experimenting!

Memmert et al. (2010), *High Ability Studies*



Game form Practice form
„Deliberate Play“ until the 14th year of living!

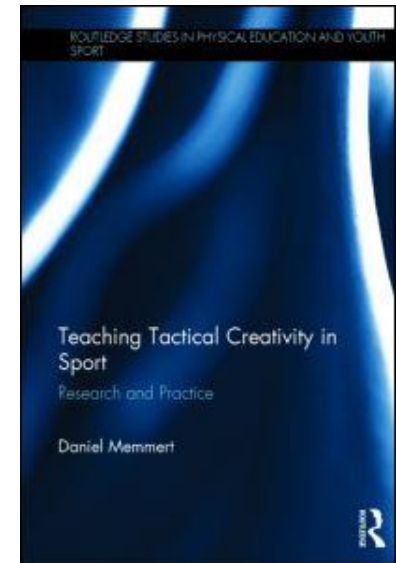
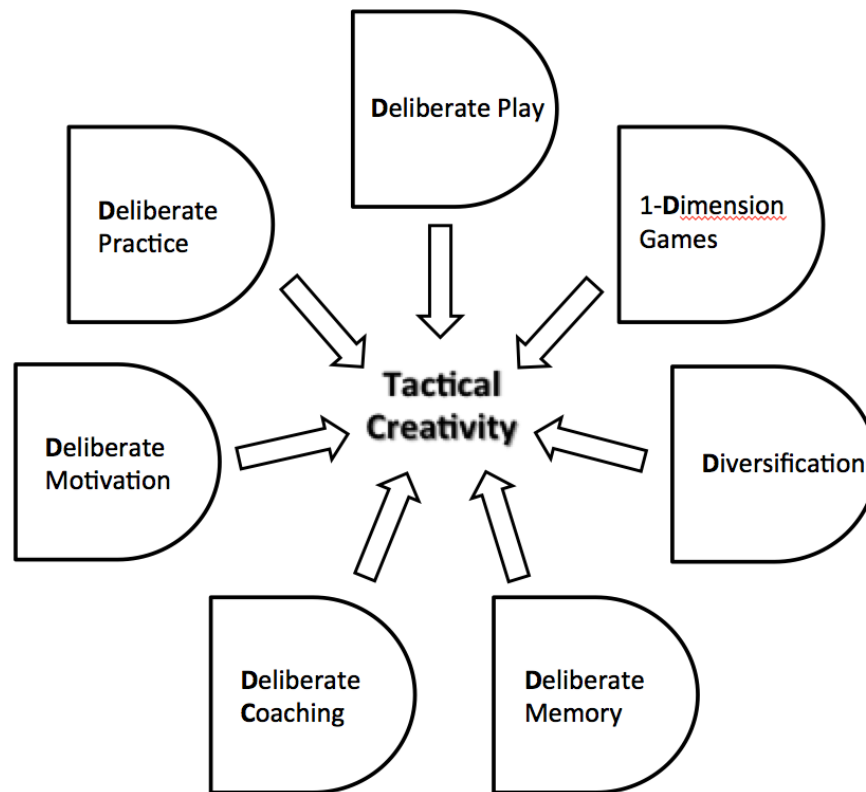
uninstructed experimenting!

Recommendation for sport lessons and training units:

Deliberate-Play:

In relatively unstructured game forms uninstructed actions can lead to trying out a manifold of solution variations.

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1-Dimension Games

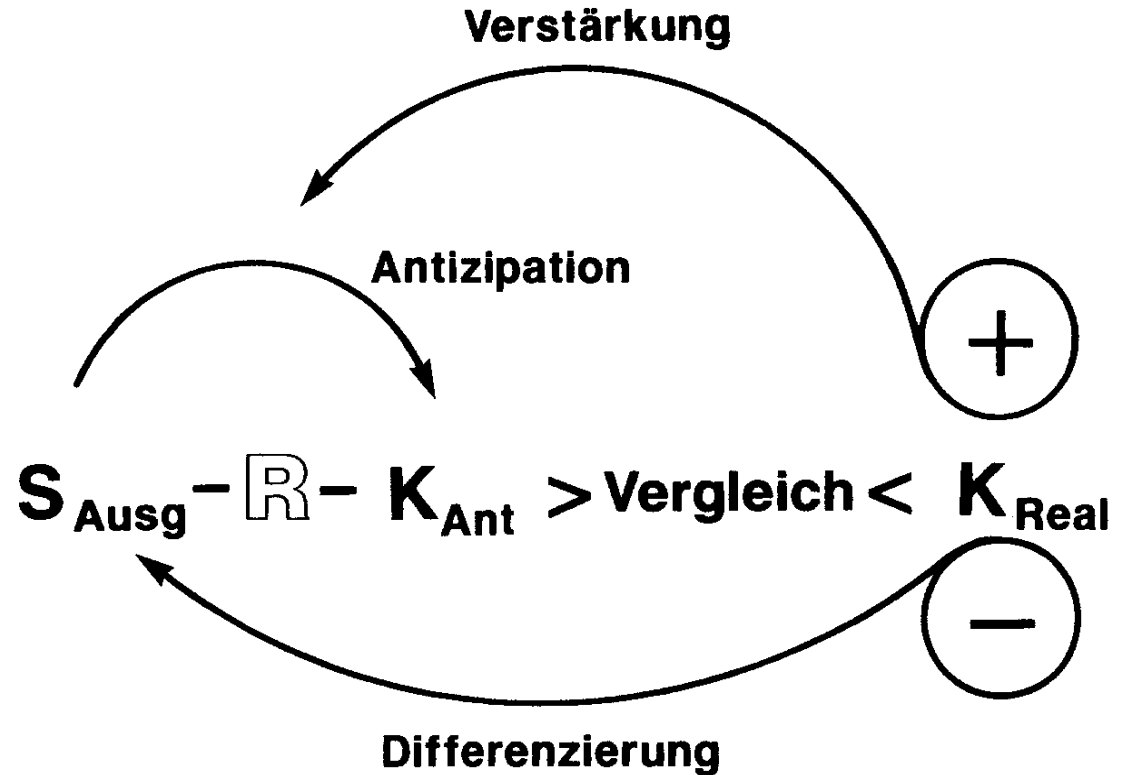
Only one tactical content!



Only one tactical category!

Decision theories (Hoffmann, 2003)

An athlete will solve situations „correctly“, when he knows exactly



„which behaviour leads to which consequences under which circumstances“

Only one tactical content!

In the context of one game form, a variety of perception can develop through many different game situations, because of a maximal variation of the behavior of team mates and opponents.

6 principles:

1. Focus on one tactic
2. Specification of certain general conditions
3. Guarantee of consistent frame situations
4. Guarantee of ever-recurrent frame situations
5. Guarantee of high repetition numbers
6. Guarantee of different teammates and opponents through systematic rotation

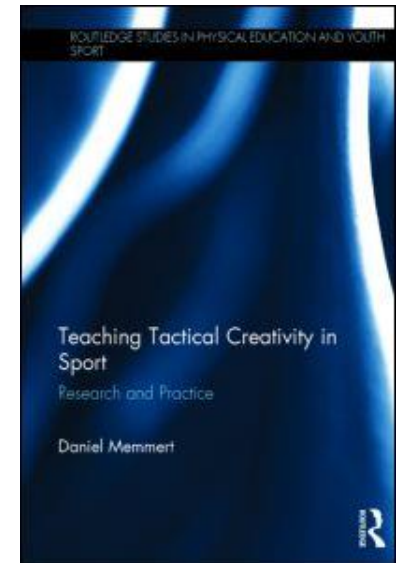
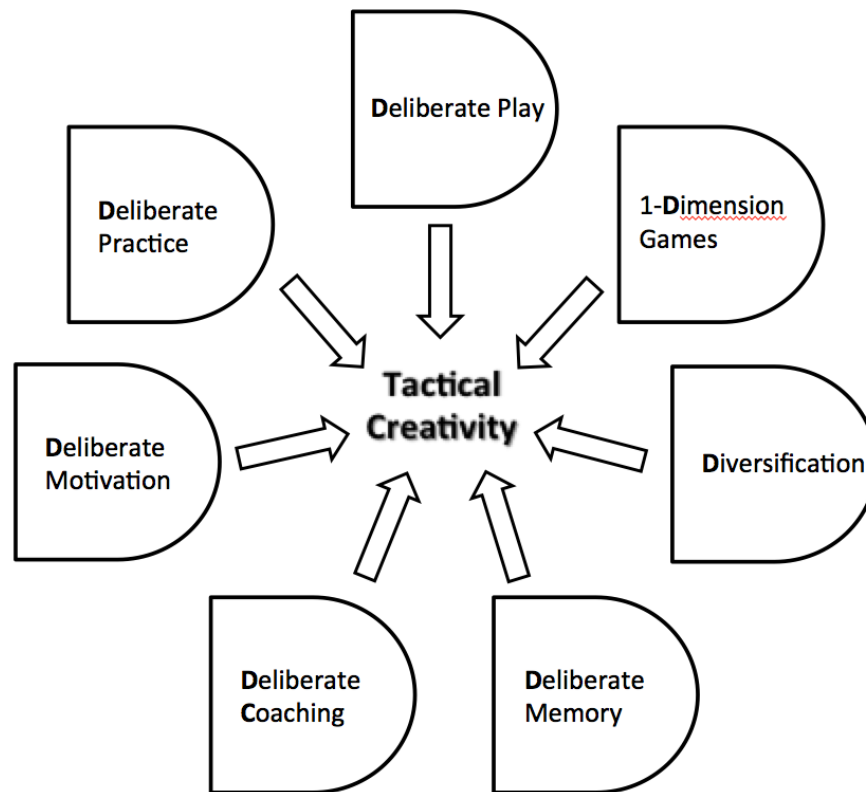
One tactic!

Recommendation for sport lessons and training units:

One-Dimension-Games:

Basic building block games can train single team/racket sports overlapping/sport specific tactics through a high number of recurrent, similar situation constellations.

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Diversification

Motor variability!



Childhood of highly creative athletes

(Hamsen, 2000)

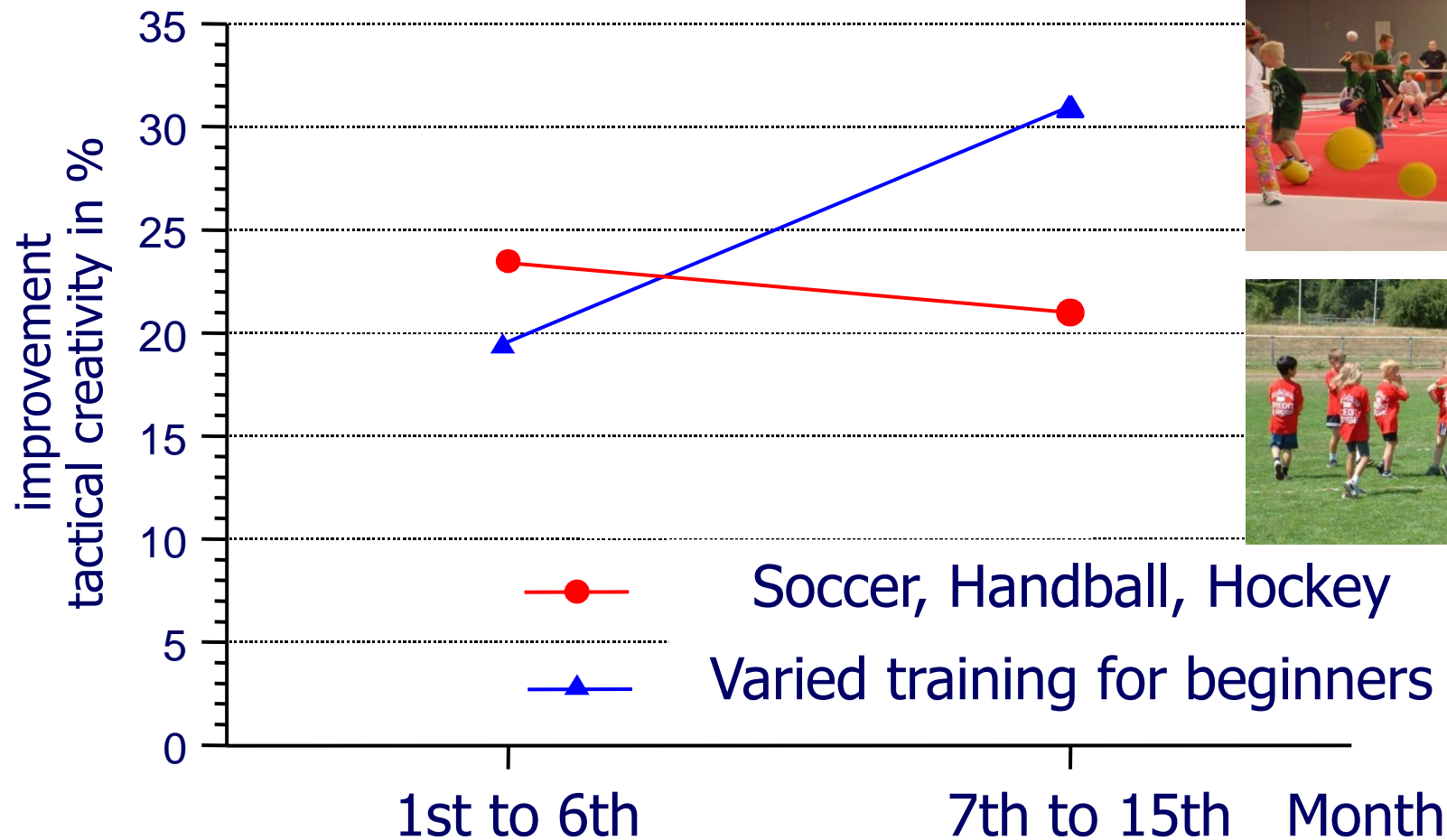
Jackson Richardson

„ ... I started on Reunion. It wasn't necessarily about getting somewhere in or learning something about a type of sport. I just wanted to have fun and try out everything. In my little home village we kids met every day at the village centre, at the beach or wherever and played something ...”

Mehmet Scholl

„ ... I've always been a kid in motion and if a ball was near me, no matter what kind, I was happy. I went outside in the afternoon and came home in the evening, it didn't matter if there was rain or snow. I just played what I just fancied: sometimes table tennis, then basketball, or handball, everything that had to do with balls...”

Diversification: Motor Variability!



Memmert & Roth (2007), *Journal of Sport Science*

Motor variability!

For the development of tactical creativity different motoric styles need to be applied, to prompt the players to always tackle tasks with a different – new – approach.



Variation in observation and change of perspective through different motoric styles

e. g. little games, basic games, building block games **with hand, foot, hockey-racket, tennis-racket**, etc.

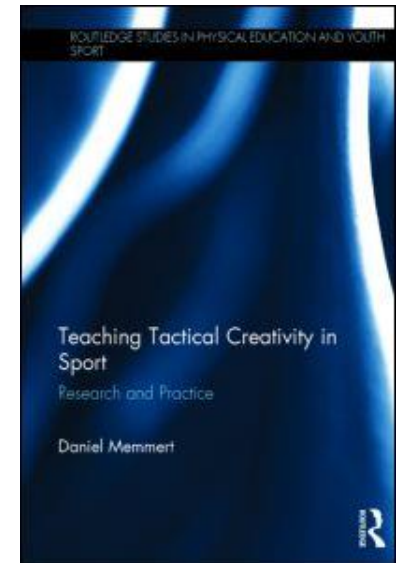
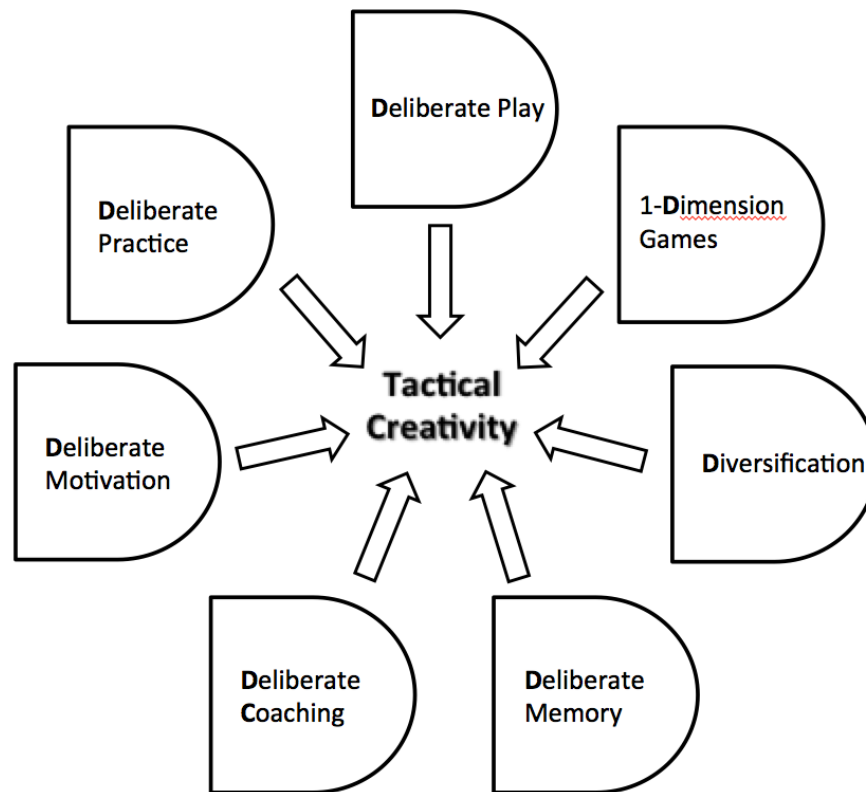
Motor variability

Recommendation for sport lessons and training units:

Diversifaction:

Use of different motor skills in 1-Dimension-Games can support the development of original solutions.

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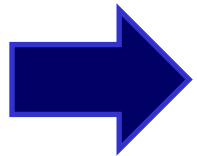
Deliberate Memory

Quantity and quality of information matters!



Working Memory

- For many cognitive tasks, memory is necessary which includes goals, important perception results, retrieved information from the long-term memory ready, and coordinates the processing of all these pieces of information.
- Nearly all cognitive achievements require temporary request-dependent supply of information.



The working memory is thus a key system for the comprehension of complex, cognitive activity (Engle, 2002).

Working Memory

“Working memory is the term that cognitive psychologists use to describe the ability to simultaneously maintain and process goal-relevant information. As the name implies, the WM concept reflects fundamentally a form of memory, but it is more than memory, for it is memory at work, in the service of complex cognition.”

-Working Memory Capacity

-General Function of Working Memory

Conway et al., (2008)

Working Memory Capacity

"A fundamental characteristic of WM is that it has a **limited capacity**, which constrains cognitive performance, such that individuals with greater capacity typically perform better than individuals with lesser capacity on a range of cognitive tasks. [...] In short, we know that variation in WM capacity exists and that this variation is important to everyday cognitive performance."

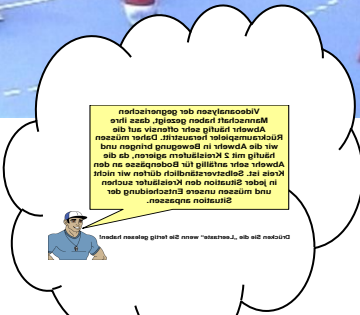
Conway et al., (2008)

Working Memory Capacity

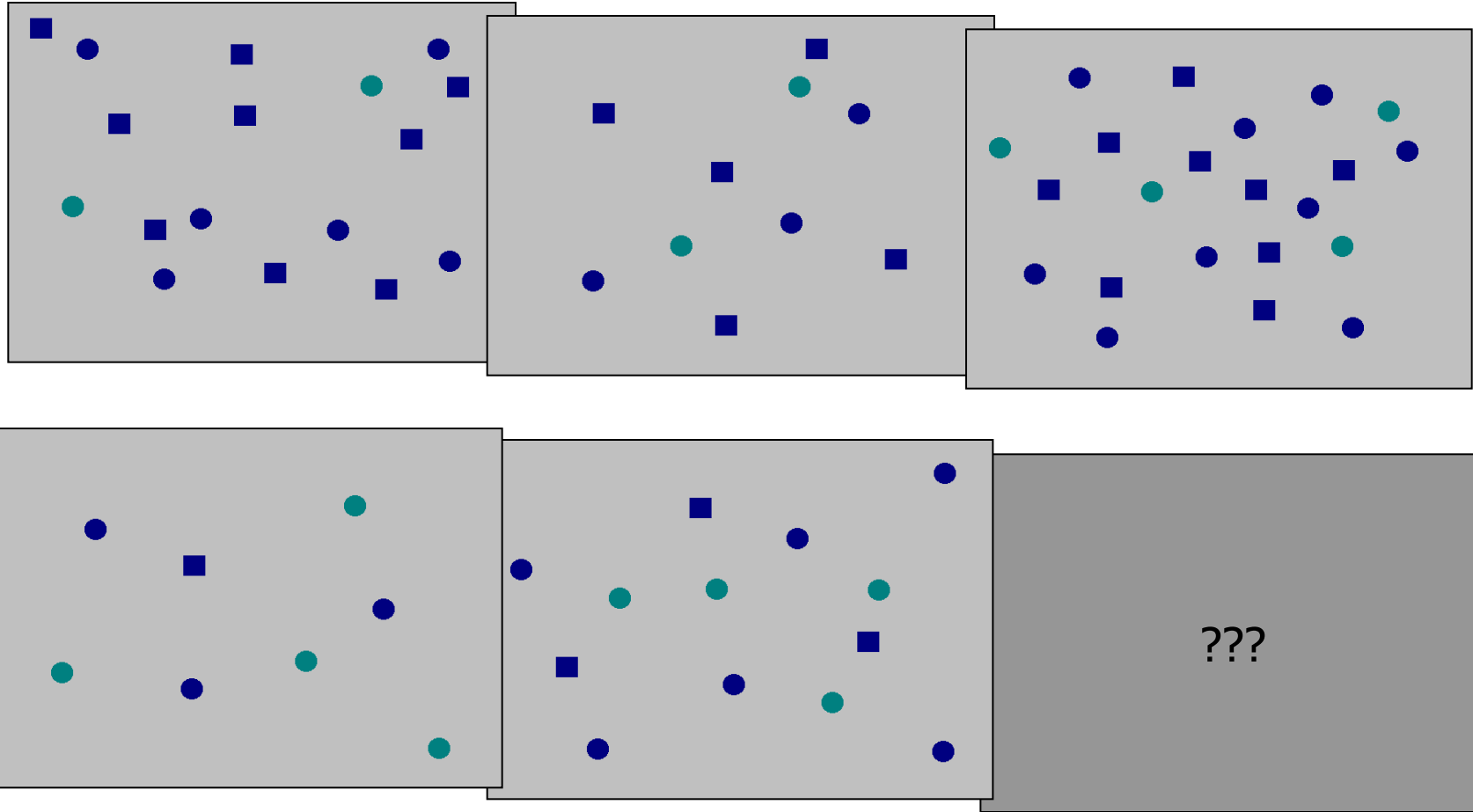


“Players can not process all of relevant information due to complexity and time constraints”

Williams, Davids, and Williams (1999)

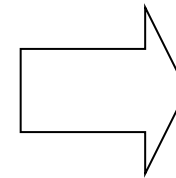


WM Capacity: Test



WM Kapazität: Limitation

No. of Elements	Item No.	Counting Span
2	1	2
	2	2
	3	2
3	1	3
	2	3
	3	3
4	1	4
	2	4
	3	2
5	1	5
	2	5
	3	3



$$\begin{aligned} &(2 + 2 + 2 \\ &+ 3 + 3 + 3 \\ &+ 4 + 4 + 2 \\ &+ 5 + 5 + 3) \\ &= 38/42 = .90 \end{aligned}$$

4-7?

Miller (1956), *Psychological Review*
Cowan (2001), *Behavioral Brain Science*

Sparin Resources: Less is more!

- Trainers need to learn to hold back.
- Don't give too many (quantity) tactical information at the same time during assignments, instructions or meetings.
- Gain competence and respect through appropriate game and training forms.

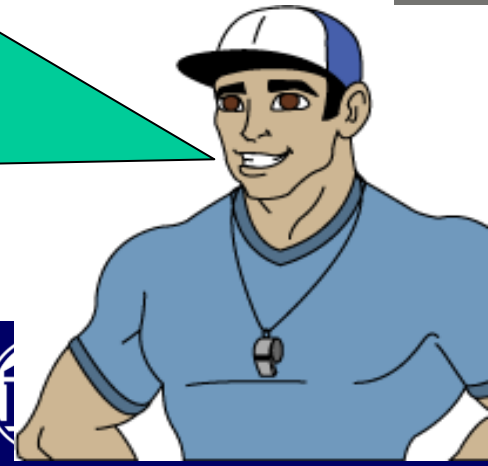
You should have shot in that situation...

Why didn't you play-back...

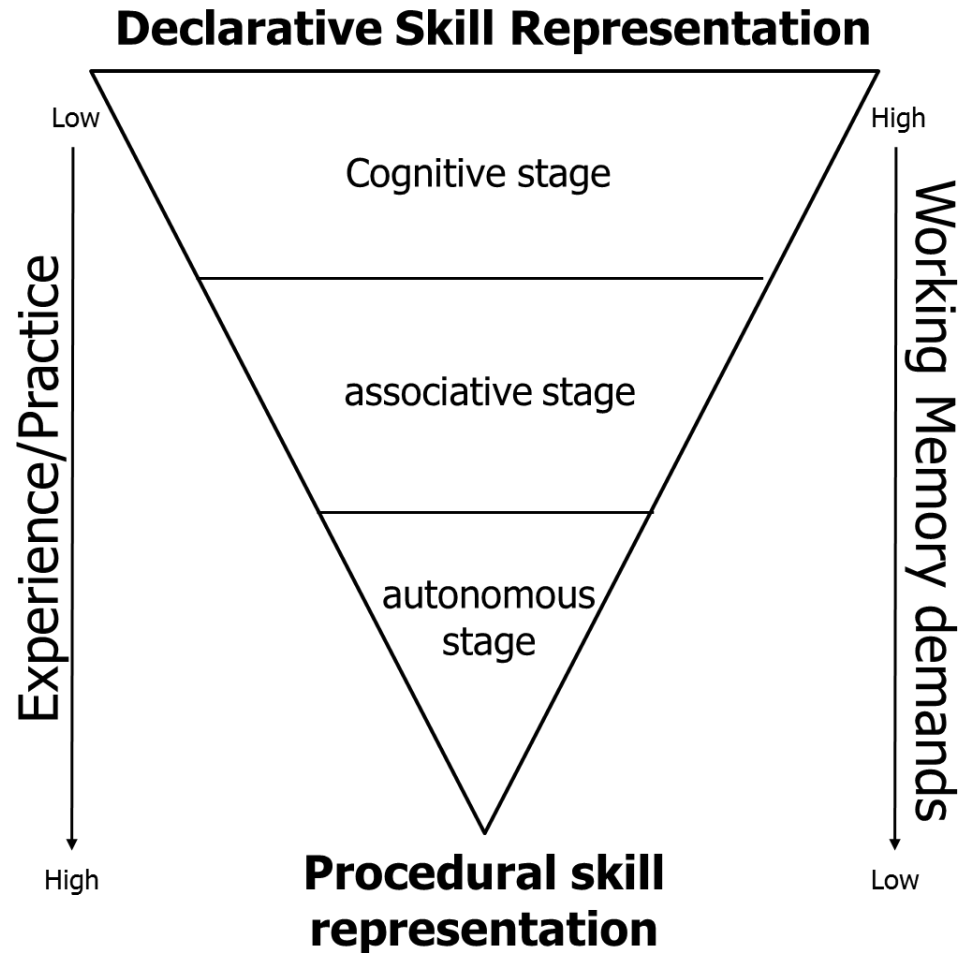
Player X was completely free...

Remember what we've said in the break...

Your opponent always does the same...

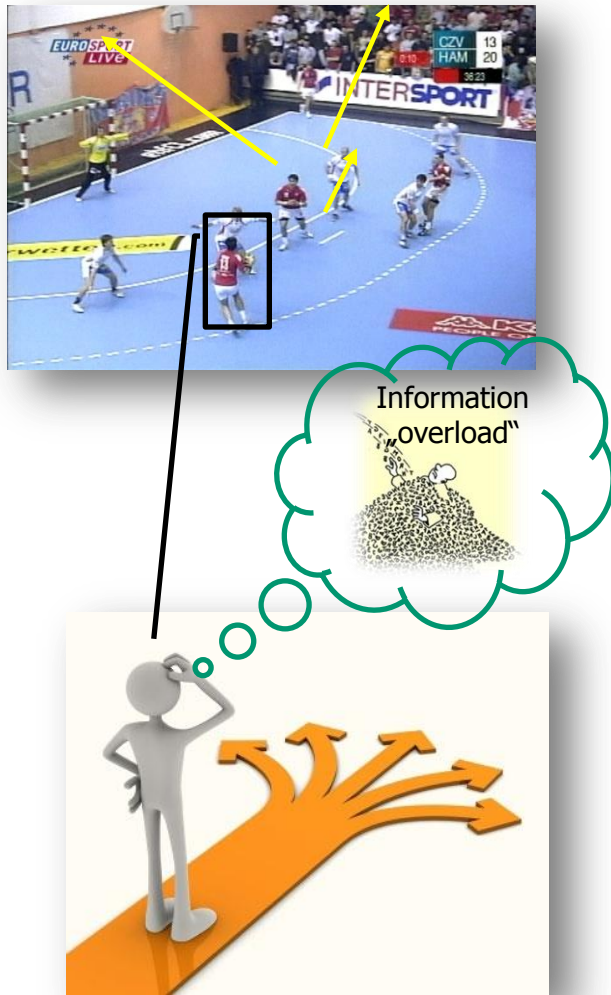


WM and learnig



Furley & Memmert (2010),
Perception & Motor Skills

Functioning of the WM



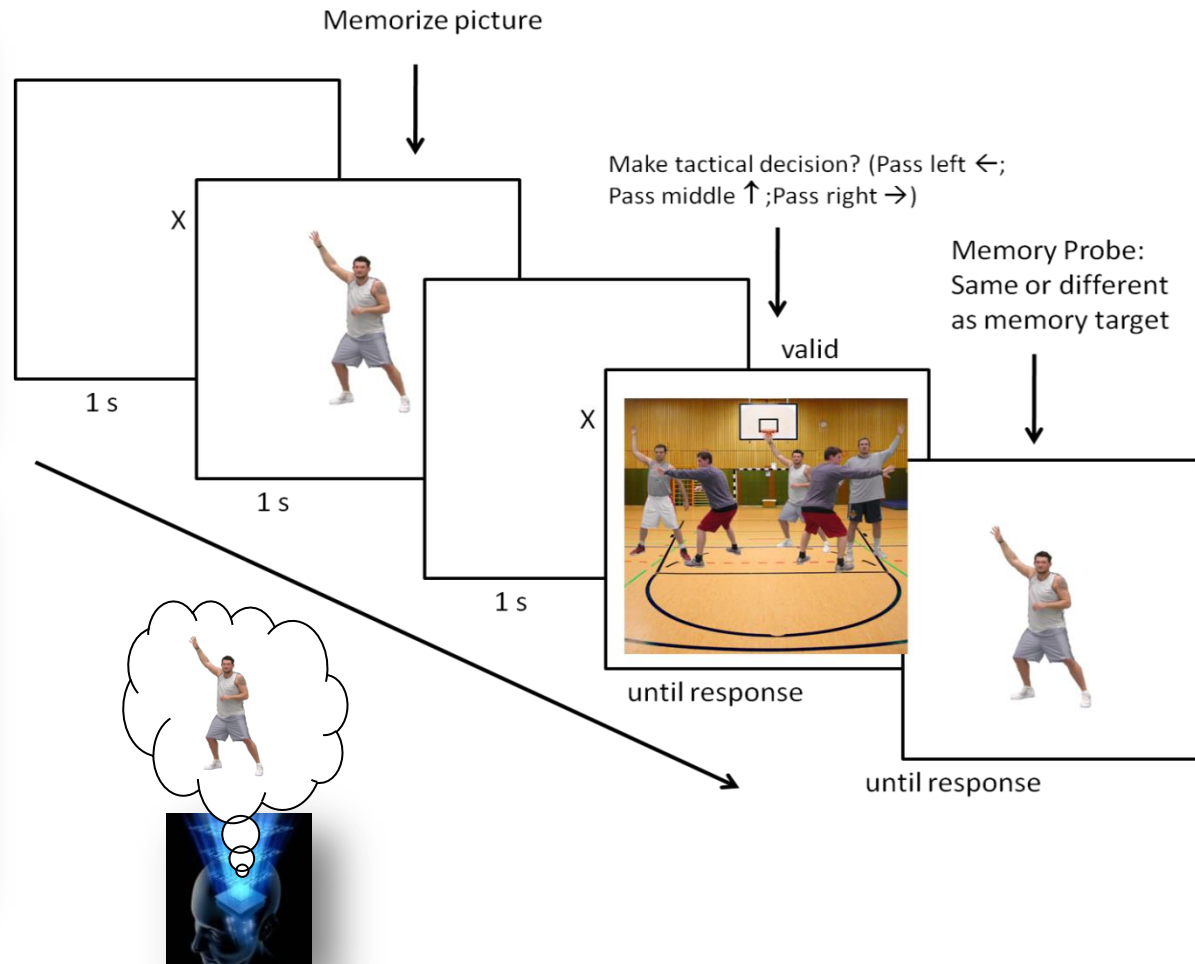
In the WM, tactical information is

- processed
- manipulated
- structured

on short notice

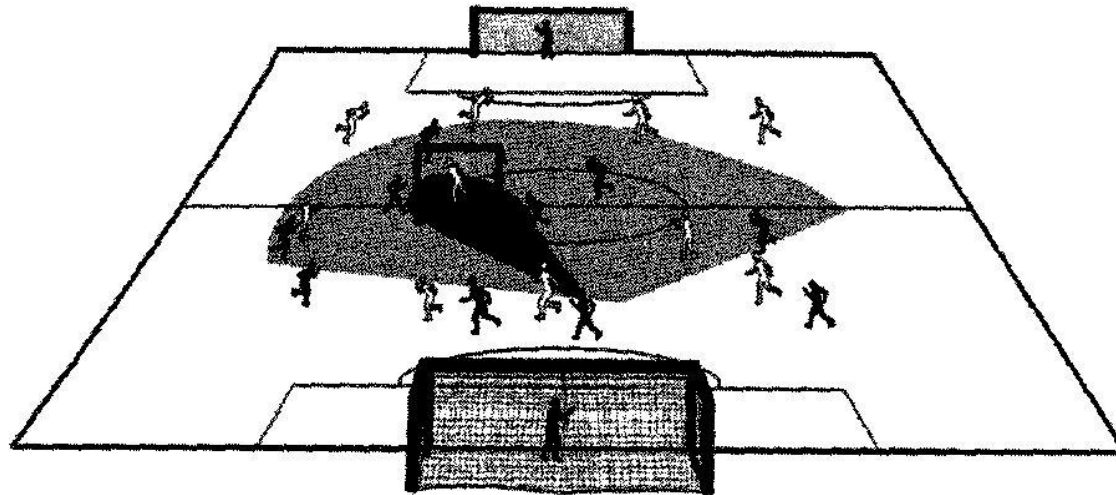
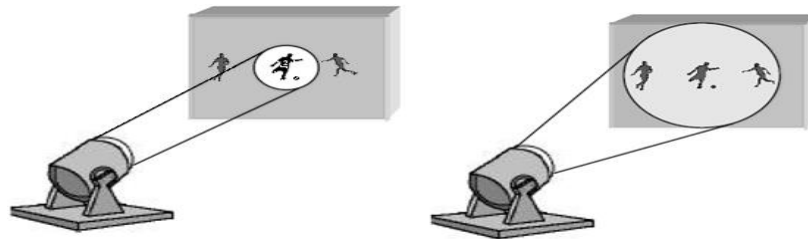
Furley & Memmert (2010), *International Review of Sport and Exercise Psychology*

Activated contents of the WM distract the attention focus!



Furley & Memmert (2013), *PLOS One*

Experts vs. Novices: Differences



Williams et al. (2006), *Perception*

Advantage or disadvantage?

Fit between instruction and situation



Instruction = Solution of the situation

Instruction \neq Solution of the situation



Tactical instructions can help



Tactical instructions can hinder

Furley & Memmert (2012), *Journal of Sport and Exercise Psychology*

Considering resources: free instead of bound!

- Activated contents in the WM (quality of instructions) influence the attention focus and therefore tactical decisions.
- Beware instructions which direct your attention.
- Gain competences and respect through appropriate game and training forms.

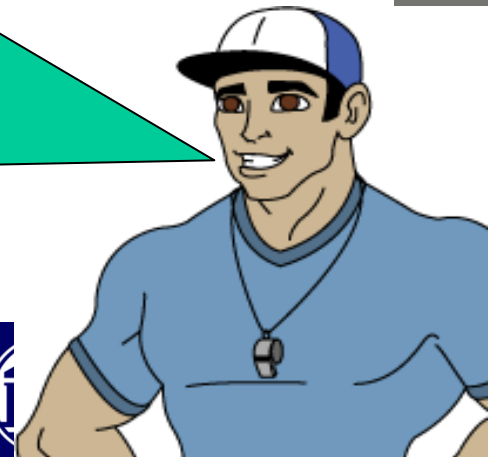
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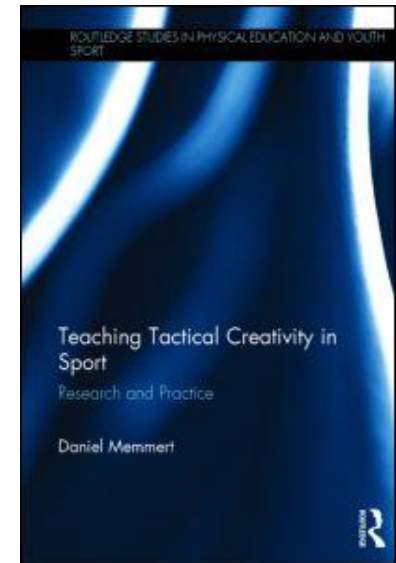
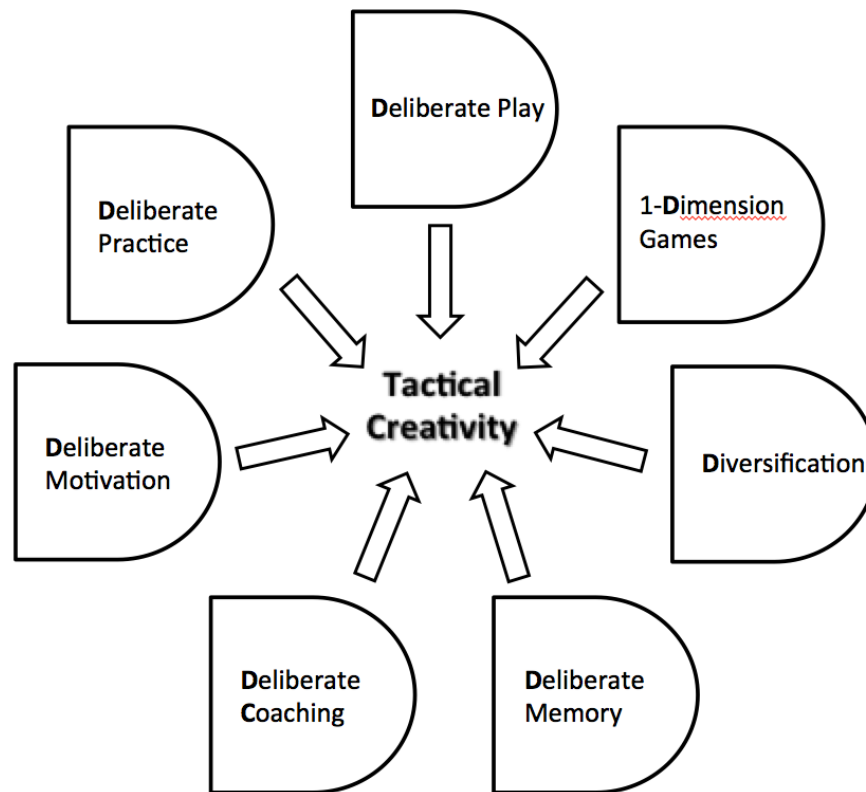
The 7 Ds of creativity fostering

Recommendation for sport lessons and
training units:

Deliberate Memory:

Quantity and quality of
information should be considered
in tactical instructions, in order to
„fill“ the working memory with
useful information.

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Deliberate Coaching

*Few Instructions &
delayed feedback!*



Inattention Blindness

1. „Looking, but not seeing!“



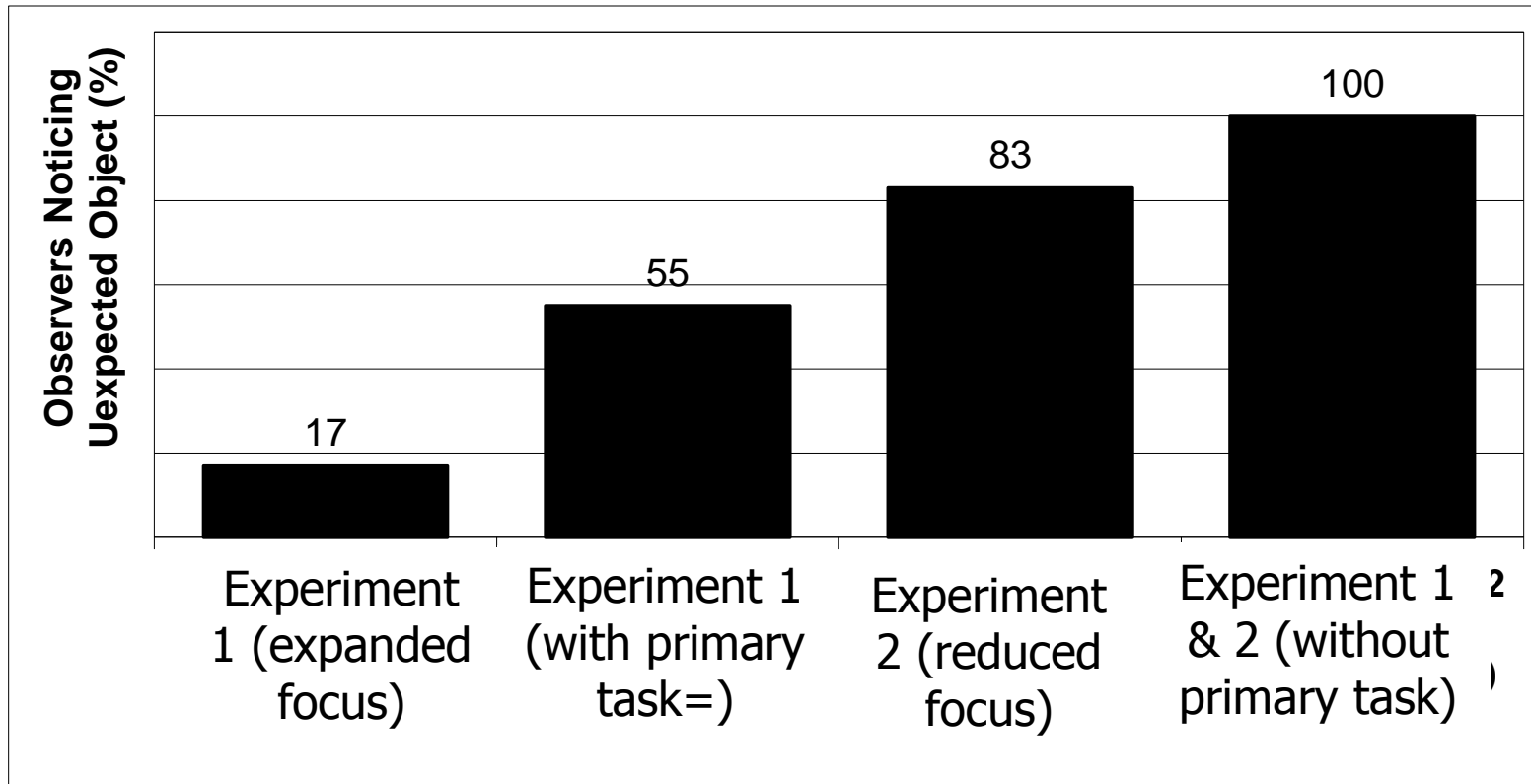
(Strayer, Drews & Johnston, 2003)



(Cummings & Tsonis, 2005)

2. Fixating does not mean consciously perceiving!
3. Conscious perception seems to require attention processes.
4. Needs to be understood as another attention dimension. Memmert et al. (2009) *PSE*

Inattentional Blindness in sports



Memmert & Furley (2007), *Journal of Sport and Exercise Psychology*

Field-based-Study: Less is more!

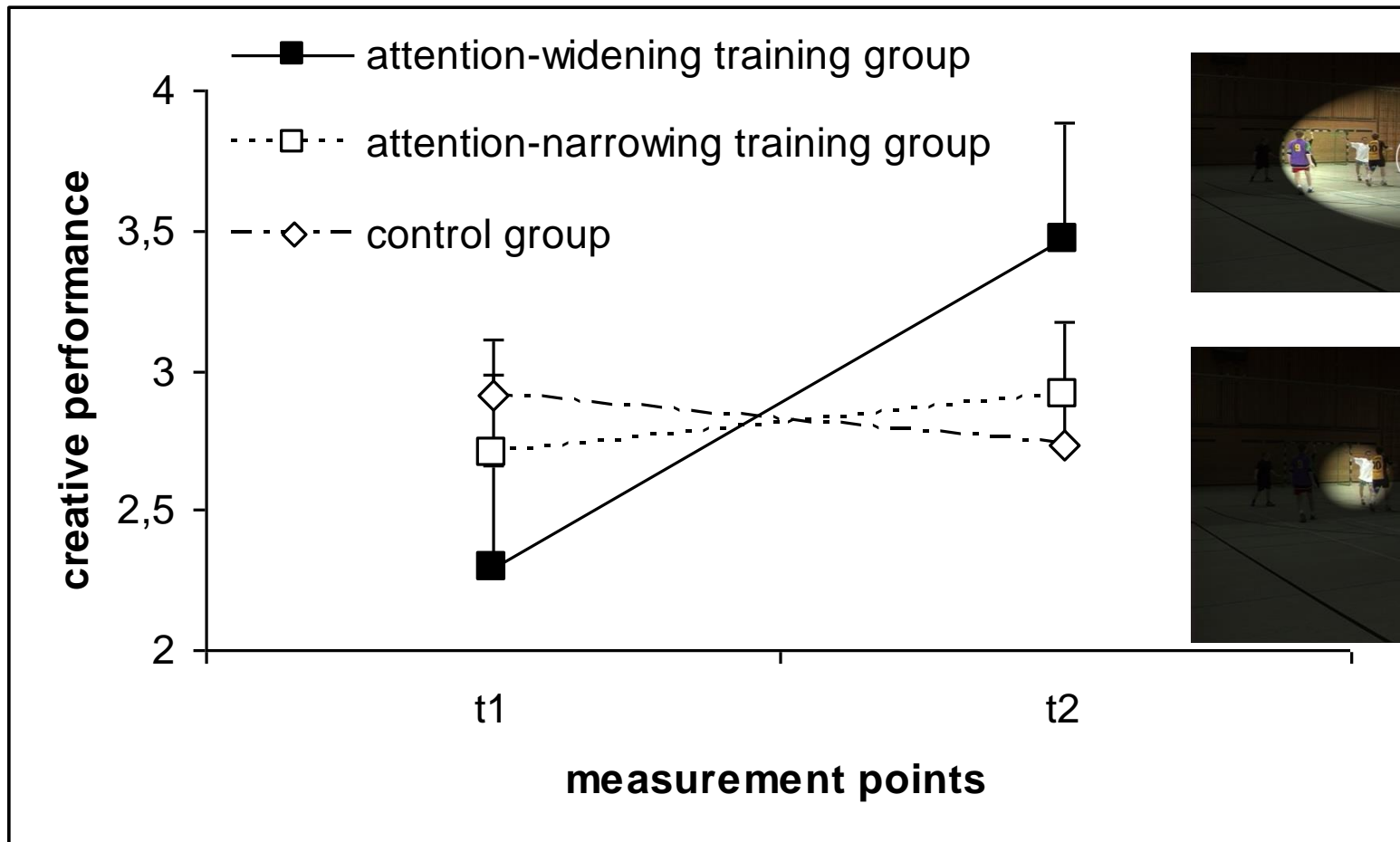
Many attention-conducting instructions of the trainer



No attention-conducting instructions of the trainer



Deliberate Coaching: Wide focus of attention!



Memmert (2007), *Creativity Research Journal*

The game is the teacher!

(Kidman & Lombardo, 2010)

Instructions (explicit learning)



Task (implicit learning)



„The not through external stimuli guided actions in the game refer to the roots of creativity... The kids have to make their own experience and shouldn't be controlled by success-addicted coaches.“ (Joch, 2000).

Delayed feedback!

„Creativity does not bloom in an atmosphere of constant criticizing, but in an environment in which fantasy and cheeky ideas are allowed.“

(Ader, 1979)

principles:

- No feedback directly after tactical action
- Solution generation and -evaluation are clearly separated from each other chronologically
- Mistakes are explicitly desirable
(keyword: differential learning)

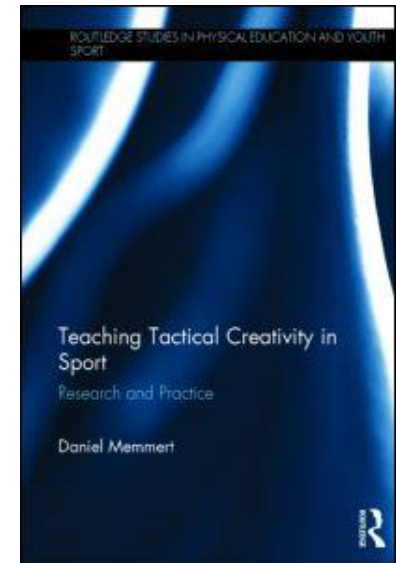
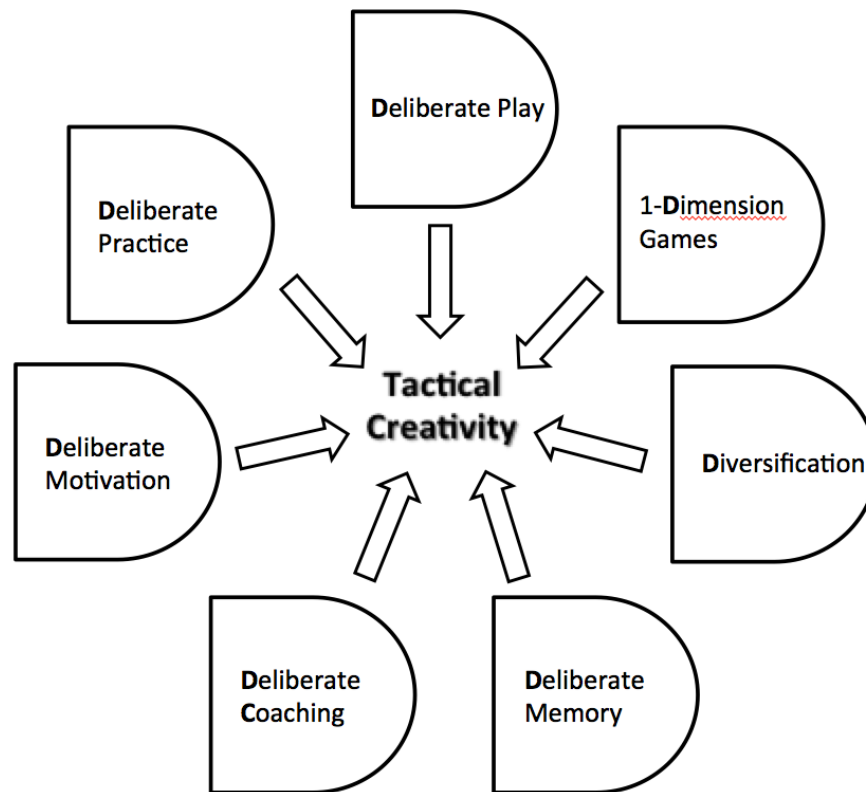
Broad breadth of attention!

Recommendation for sport lessons and training units:

Deliberate Coaching:

Instructions, which reduce the attention focus of the actors, should not be included into game forms.

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Deliberate Coaching

Promotion focus!



Deliberate Motivation

2 types of self-regulation for the striving for the desired target states
(Higgins, 2007)

Promotion Focus (Hope-Focus)

Prevention Focus (Duty-Focus)

- Final state = Ideal(maximum-)goal
- Focus on performance and hope

- Final state = Duty(minimum-)goal
- Focus on safety and responsibility

Creative solution

Analytical Solution

Motivation & control

2 forms of behavior

Promotion Focus

keen

faster

vague

more open

broad attention

more creative

promotion behaviour

Prevention Focus

alert

slower

more precise

conservative

narrow attention

detail-oriented

prevention behaviour

Deliberate Motivation

2 types of self-regulation for the striving for the desired target states
(Higgins, 2007)

Promotion Focus
(Hope-Focus)

Prevention Focus
(Duty-Focus)

- Final state = Ideal(maximum-)goal
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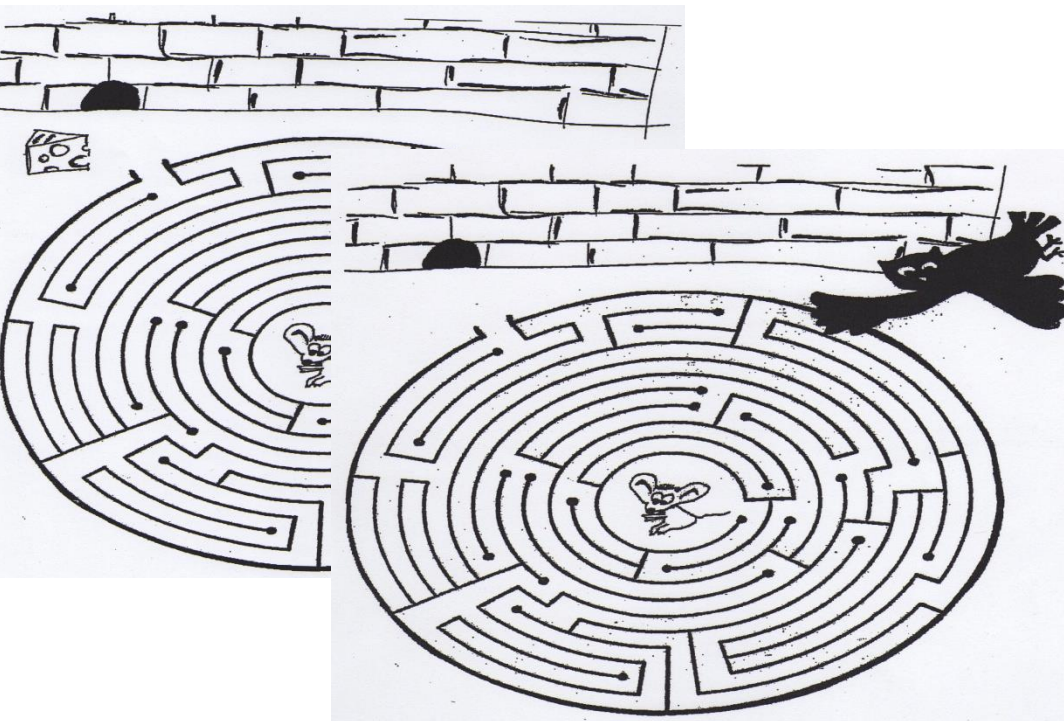
- Final state = Duty(minimum-)goal
- Focus on safety and responsibility

Creative solution

Analytical Solution

Task framing

Pencil-and-paper maze (Friedman & Förster, 2001)

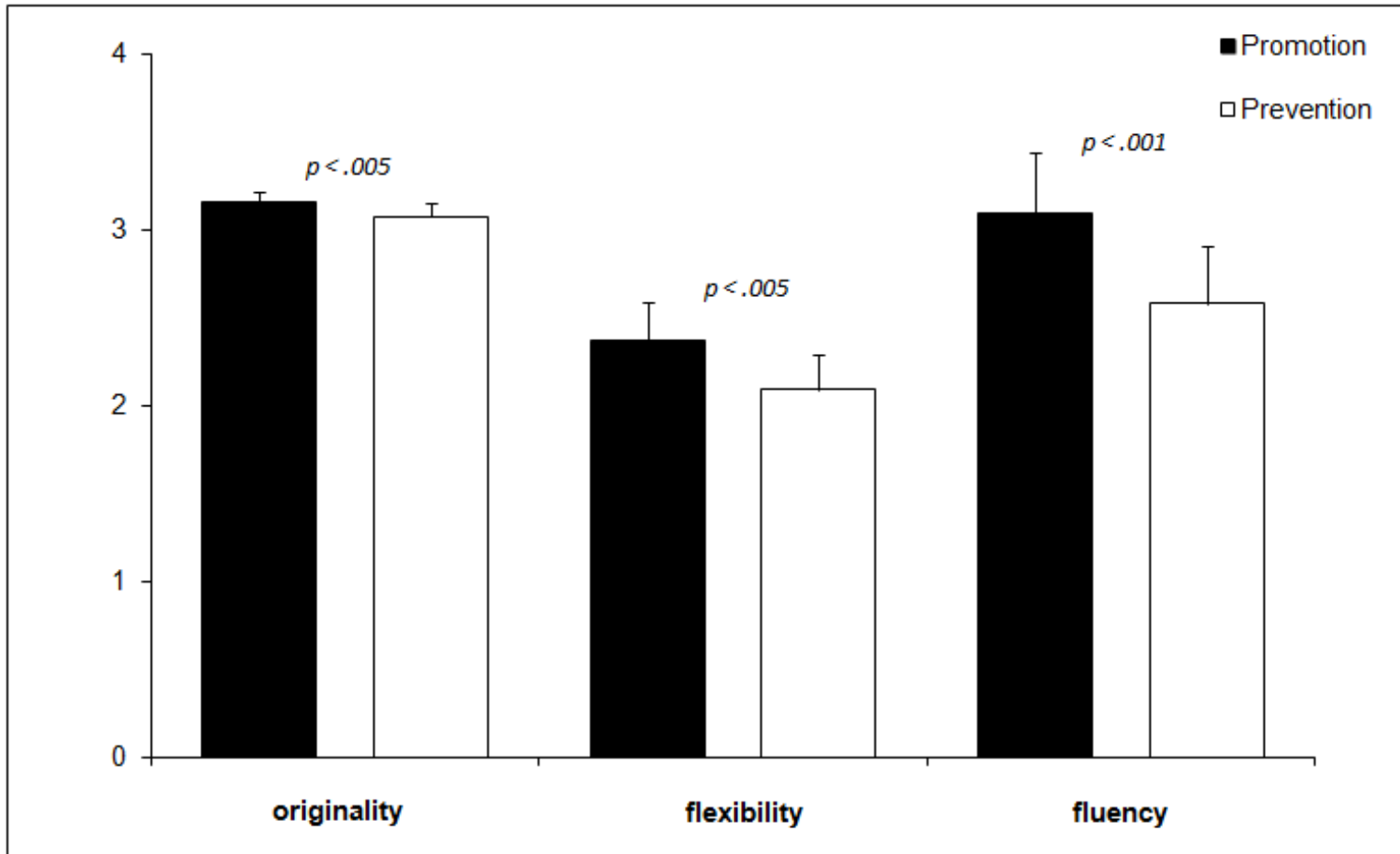


Promotion

Prevention



Promotion-focus increases the creativity



Memmert, Hüttermann, & Orliczek (2013), *Journal of Applied Social Psychology*

Announcement in training: hope orientation!

content: Pass into the interface, direct free kick, (no penalty!)

Not: It is your duty that....

But: Your hope is that....

It is your goal that....

I would like that....

Example: I would like that every third ball is played into the interface. Not: I am expecting from you that every third ball is played into the interface.

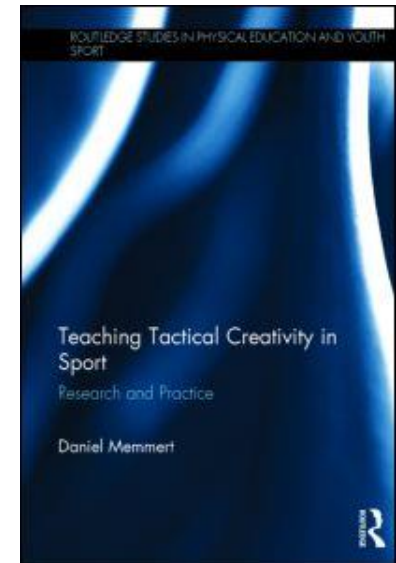
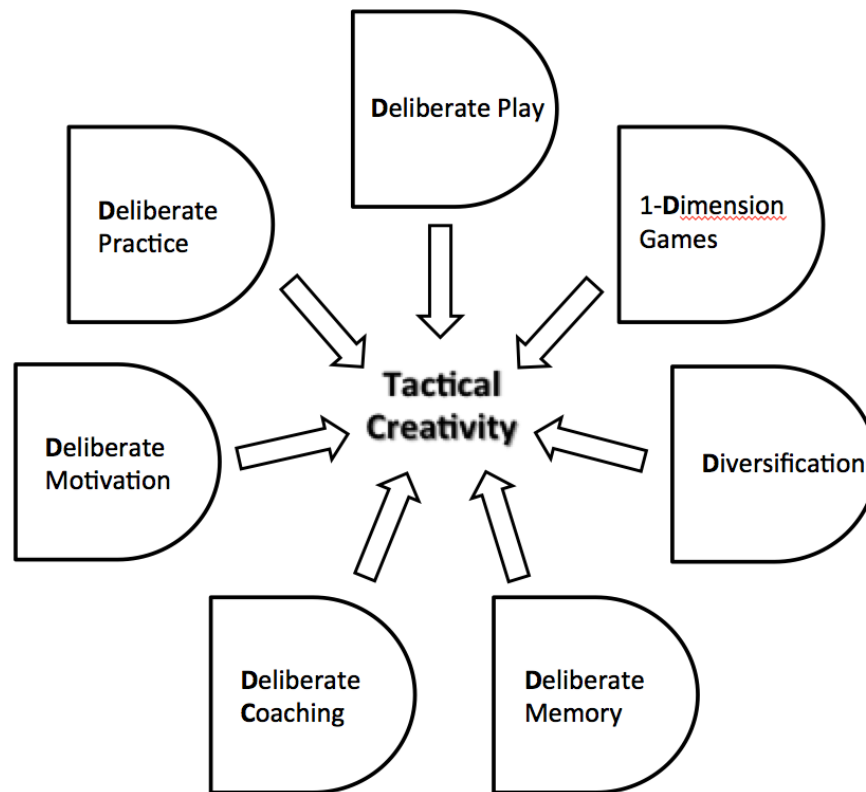
Every word counts!

Recommendation for sport lessons and training units:

Deliberate Motivation:

Hope-based instructions, which raise the generation of unusual solutions, should be included in game forms.

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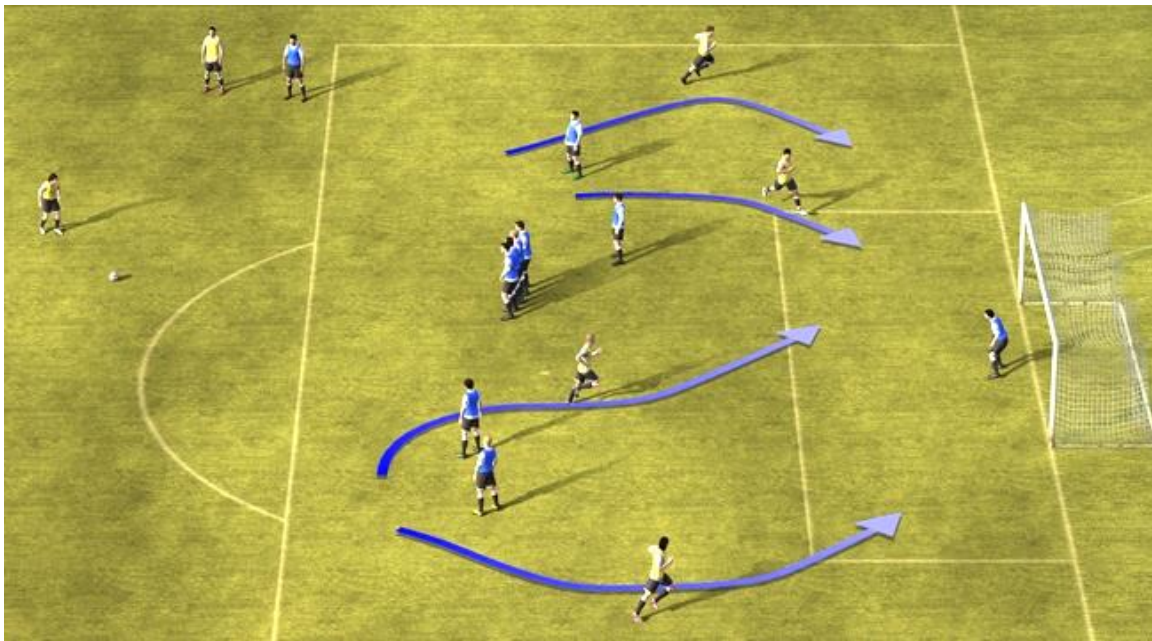
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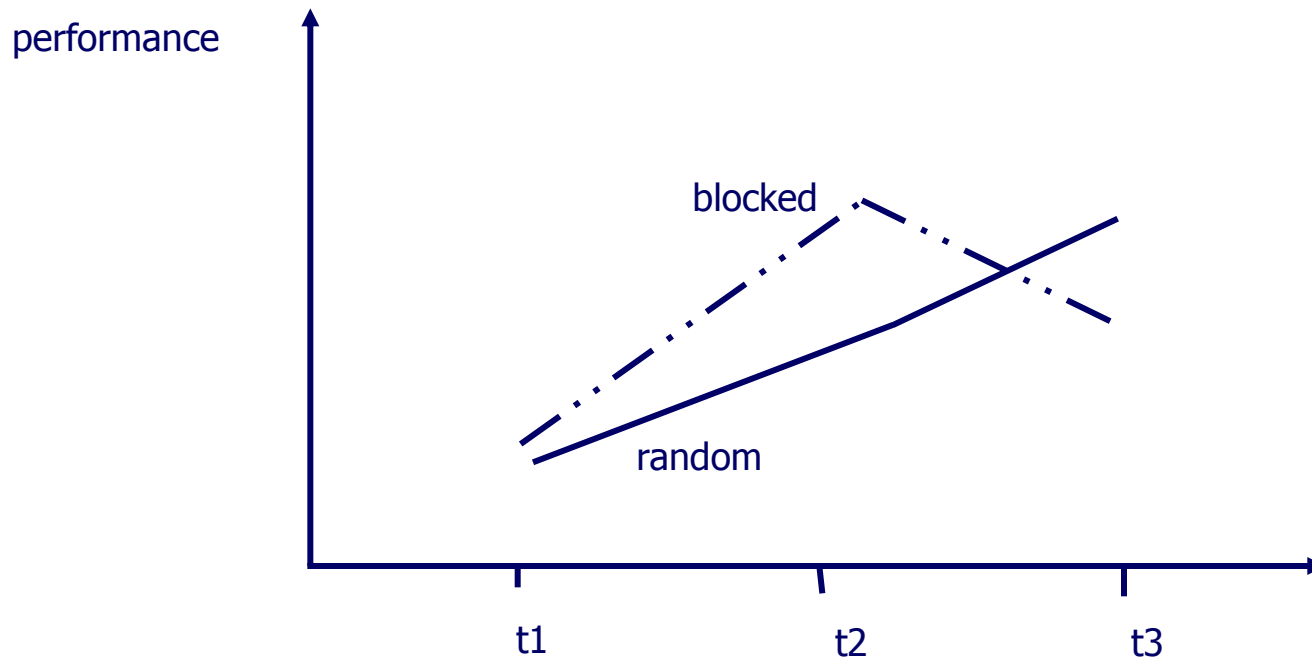
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Deliberate Practice

Situation-specific overwork!

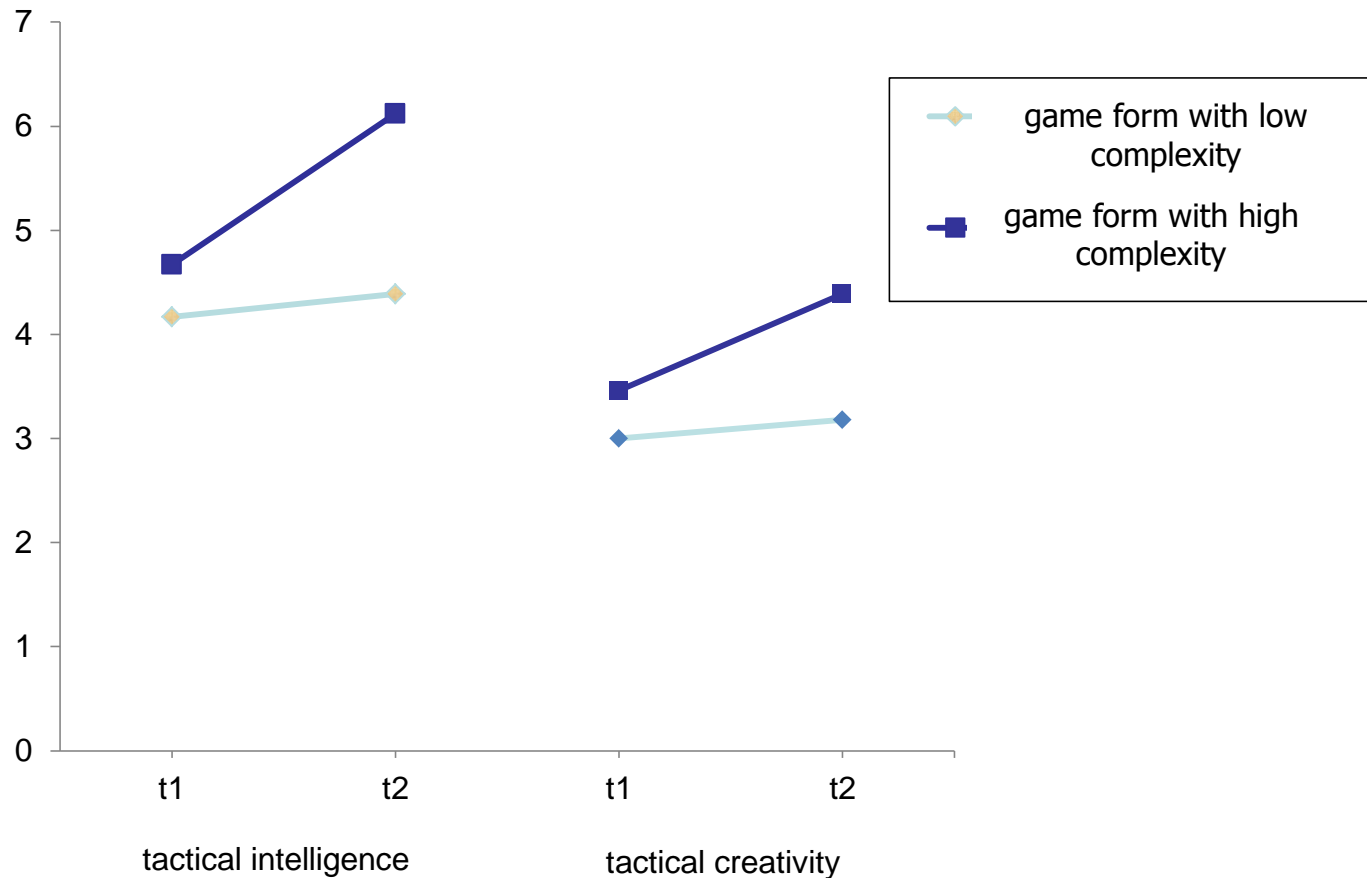


Context-Interference (CI)-Effect



(z. B. Gabriele, Lee & Hall, 1991; Hall & Magill, 1995; Lee & Magill, 1983; Shea, Kohl & Indermill, 1990; Sherwood, 1996; Wrisberg & Liu, 1991; Young, Cohen & Husak, 1991; for a review see Magill & Hall, 1990; Wulf & Schmidt, 1994)

Deliberate complex Environment



Greco, Memmert & Morales (2010), *Perceptual & Motor Skills*

High situative complexity!

conclusion: letting „situations“ speak allows for creative behavior!

Training centred demands (low complexity)



Open situation tasks (high complexity)

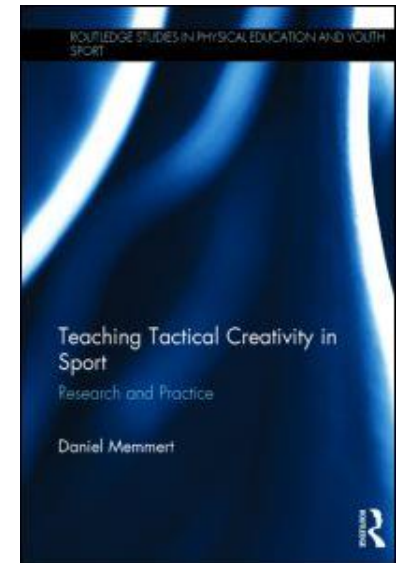
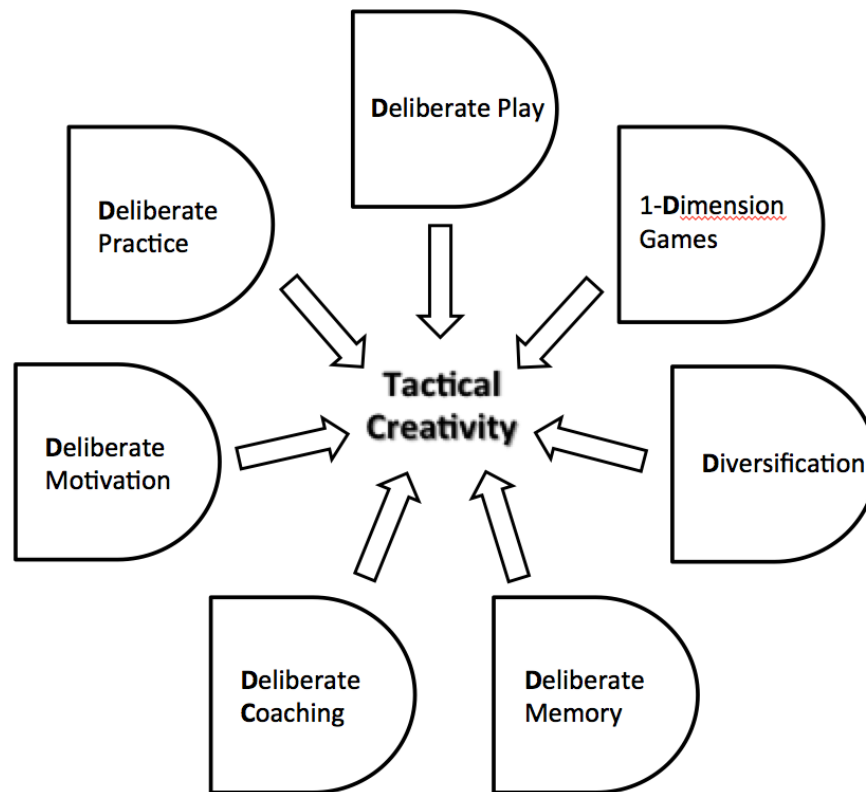
The 7 Ds of creativity fostering

Recommendation for sport lessons and
training units:

Deliberate Practice:

In more advanced, complex
games, task-centered practice can
lead to repeat and explore seldom
but adequate solutions.

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