Daniel Memmert

THE MENTAL GAME

COGNITIVE TRAINING, CREATIVITY, & GAME INTELLIGENCE IN SOCCER

FOREWORD BY

GERMAN NATIONAL TEAM COACH, JOGI LÖW

MEYER & MEYER SPORT

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With love to Kerstin, Kim, and Lina

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FOREWORD

BY JOGI LÖW

German National Team Coach Joachim Löw

The game with the ball, just a child's game? It is precisely the unpredictability of the game of soccer itself, whether played with the hand or with the foot, that represents a huge future challenge. I said a long time ago that this is why creativity and playful class will be the new German virtues. Physical presence and technical ability are slowly reaching their limits in soccer. We have all been seeing and feeling this for some time. No longer are running data, duels won, commitment, and will the only decisive factors.

Our 2014 World Cup win in Brazil in particular proved that teams have always had players who are among the best in the world mentally, cognitively, and in terms of individual tactics. This puts attention, perception, and anticipation, as well as creativity and game intelligence and working memory at the center of modern soccer training. There is still a great deal of potential in this cognitive area.

What can other athletes do better; what do other sports demand? A chess player thinks 10 to 20 moves ahead. Ice hockey is fast and dynamic in its interpretation; basketball or handball have time constraints and are therefore built on speed.

The soccer game of the future also requires the soccer player. Some could and can already represent this today. Names like Toni Kroos or Andrea Pirlo, Xavier Hernández Creus, called Xavi, or Andrés Inesta are proof of this. The mental willingness to think accurately ahead a multitude of moves, a mental agility coupled with a silent pre-orientation, has distinguished these world-class players. Therefore, I still see the need for great resources in cognitive soccer education.

Unfortunately, there are almost no scientifically validated books on this subject. I am therefore grateful that Daniel Memmert has made the first advance here. How do you train "adaptation artists" in the context of "organized" chaos, who can always solve new, unpredictable problems? What are cognitions, which ones are crucial? How can they be trained and exercised? Why do we need to "instruct" less in training, but "supervise" more? And, how can we make cognitive developments transparent and check and test them? Questions that are seeking answers!

And this book can answer these questions!

I am very pleased that the author has succeeded in bringing light into the darkness and in presenting secured findings on the training of cognitive abilities. I am impressed by the findings of sports science and especially sports psychology in this field of research.

I hope you enjoy reading this book and that you have success and fun with the most beautiful pastime in the world.

–Joachim Löw
German National Team Coach

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Daniel Memmert

During an advanced training course at Rasenballsport Leipzig, which I had the pleasure of leading, the head of the youth academy of RB Leipzig (previously VfB Stuttgart), Thomas Albeck (* 30.01.1956- † 17.10.2017), urged me to write a book about cognition in soccer. I am now fulfilling this wish.

A research program rarely results from the ideas of one individual, but rather from the collective thoughts of many in a comfortable atmosphere.

I would like to thank the many colleagues with whom I have had the privilege of researching and publishing on the topic of cognition in recent years and whose ideas I have integrated (cited, of course): Dr. Philip Furley, Prof. Dr. Norbert Hagemann, Jun. Prof. Dr. Stefanie Klatt, Dr. Timo Klein-Soetebier, Prof. Dr. Stefan König, Dr. Carina Kreitz, Dr. Benjamin Noël, Prof. Dr. Klaus Roth, Erik Scharfen, Dr. Sebastian Schwab, and Prof. Dr. Matthias Weigelt. Of course, thanks also to all students who have made valuable contributions to the individual sub-studies.

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1 SOCCER GAMES ARE DECIDED IN THE HEAD...

Kevin De Bruyne, Eden Hazard or Luka Modric – they are all able to find extraordinary, technically and tactically optimal solutions in extremely complex situations. Successful coaches or teammates mention "mental speed," "the head is important," "very quick-minded" or "intelligent players" in the context of such exceptional players."

"Great individualists who can solve tight game situations in an extraordinary way are missing. The players in this country were not trained to enjoy fooling an opponent or playing for the gallery." –Nico Kovac (German Bundesliga Coach)

"As far as physical presence is concerned, soccer is reaching its limits. In the cognitive field, on the opposite, there are infinite possibilities. A chess player thinks ten to twenty steps ahead; a soccer player should be able to do the same in the future. Some players already can. Özil, Kroos or Pirlo can play the ball into the depths. They know that one of their teammates will run into it. Such players think one step ahead. So, there is potential to think ahead. That is why I still see great resources in cognitive training. From my point of view, data or statistics about ball possessions are not necessary anymore." –Joachim Löw (German National Coach)

"The Spanish cannot be beaten with tactical aggressiveness, duel strength or hardness. They cannot be reached with these strategies. They are mentally too fast. And that is exactly what will become an important challenge and development for all players. It is a matter of being mentally fast nowadays. Maybe the mental speed is still to be ranked above the physical speed. If a player has a good technique and a good basic speed, but is too slow in the head, it can reduce his value to the team." –Joachim Löw (German National Coach)

"Soccer is about the intelligent play when possessing the ball, about technique in the movement with the ball, and about speed. But I am not only talking about gear. Usain Bolt is fast, but he cannot play soccer – what I mean is mental speed. Soccer is about conquering the ball. As a coach, it is good to have intelligent players who can also play on both feet." – Lucien Favre (German Bundesliga-Coach)

"Soccer is played with the head. Your feet are just the tools." –Andrea Pirlo

In soccer magazines, it is sometimes called action speed, and in soccer books, it is underlined several times that "soccer games are decided in the head," (Memmert et al., 2013). In addition, a large number of studies described in sports science journals confirm the particular importance of linking perceptive abilities and reaction or action speed (= "Reactive Agility").

Speed of execution (according to Friedrich, 2005, p. 143)

"Especially in sports games, it is essential to implement technical and tactical actions successfully according to the situation. The level of action speed is defined by the total time required for the cognitive processes (mental speed) and the motor solution of the active task."

All concepts and approaches in sports seem to have something in common. The head, and therefore cognition, seems to play a fundamental role during games, and this is particularly evident in soccer.

In sport, cognition is the problem-solving process necessary for generating adequate solutions in specific situations. To this end, this book presents a model of the processes of human decision-making. Cognitive abilities such as anticipation, perception, memory or attention that contribute to creativity are described. This also includes game intelligence, which describes the selection of the best decision. In a more general sense, cognition can also add will, moods and emotions. In training, it can now be a matter of practicing all these abilities individually or in combination, making them available in the memory.

Soccer plays a vital role in sports science. There are many research results, particularly in the field of attention, perception and anticipation, as well as creativity, game intelligence and working memory, which considered these abilities in soccer. Nevertheless, many scientific results have not yet been put into practice, as made apparent by this example reported in astonishment: Thomas Tuchel instructs forms of switch play in which about four different colors (bibs of the various teams in relation to four goals) take part. Although this is considered revolutionary, there is still much more that can be achieved.

For the first time, scientifically founded statements about cognitive training in soccer are provided in this book. The content, methods, diagnostics and practical aspects of the cognitive training are also discussed.

The first part of the book presents the basics of cognitive training: What are the key factors that can be trained? What kind of models are available? What kind of evidence is available? In addition, these findings are linked to coaching practice. With a single word, coaches can vary the players' focus of attention. Maximum attention is needed in situations where variability and creativity are required. If, on the other hand, movements and actions are to be anticipated, or attention is required for specific events, then a

narrow focus of awareness can help. Over the past 15 years, many studies have been conducted, and the role of the working memory in such situations is now apparent.

The possible cognitive diagnostics are subdivided into tests on elementary cognitions in the laboratory, or the field on the underlying model. To determine, for example, how significant the attention focus of a player is, his attention window can accurately be determined in the laboratory. In very extensive sport scientific studies with top athletes, there are also attention tests that were developed to precisely specify the attention window of an athlete. In addition, there are also diagnostic tools that can be used in practice. It is possible to see, for example, how players can shield themselves from interfering variables, how much distributed or selected their attention is, and how well they are able to focus. There are now numerous test procedures to assess these situations. At the same time, there are established game-related sports game tests in the field (indoor or outdoor) that can be used to evaluate the athletes' skills in finding gaps, and releasing in space.

In the second part of the book, some cognitive coaching examples are presented. Trainers and clubs need to be aware that attention and creativity can be trained. Anticipation particularly, as well as perception and focus, can be excellently trained. In the following chapter, numerous types of games, structured according to the content model of cognitive training, are presented.

2 DEFINITION AND RELEVANCE OF COGNITIONS

What exactly is cognition, or cognitive processes, from a scientific perspective?

The use of the term "cognition" has a long tradition, ranging from Tolman to Hebb and Neisser to Gazzaniga – all famous scientists. At this point, no precise overview of the existing diversity of definitions is presented (e.g. for an overview in psychology, Neisser, 2014; for an overview in sport, Memmert, 2004a). In contrast to purely physiological, neuronal and precognitive processes, Roth and Menzel (2001, p. 539) characterize mental performance through six cognitive processes:

1. Integrative, often multisensory and experience-based processes of perception.

2. Processes that involve recognizing individual events and categorizing or classifying objects, people and events.

3. Processes that take place either consciously or unconsciously based on internal representations (models, imaginations, maps, hypotheses).