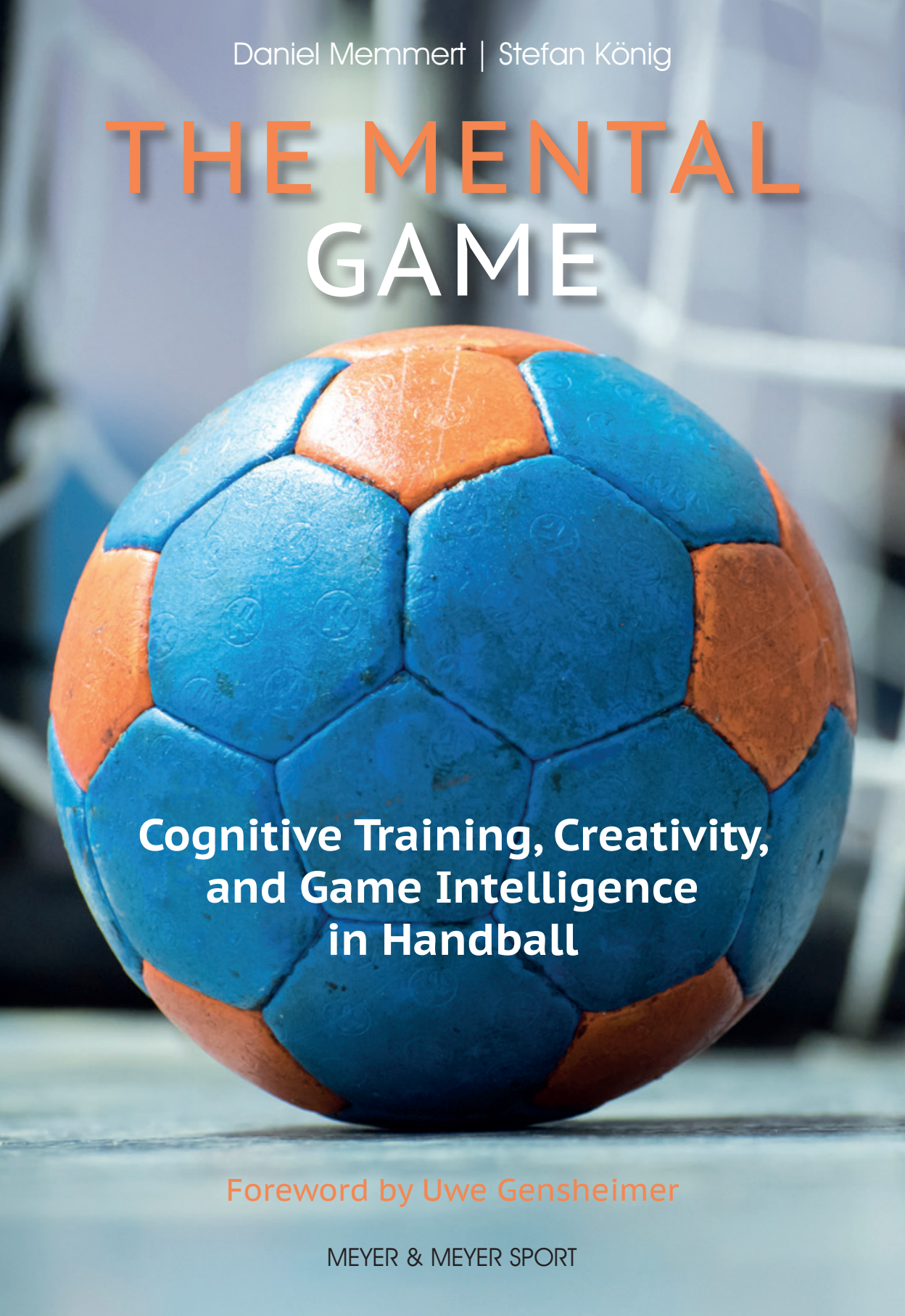
Daniel Memmert | Stefan König

THE MENTAL GAME



Cognitive Training, Creativity, and Game Intelligence in Handball

Foreword by Uwe Gensheimer

MEYER & MEYER SPORT

The Mental Game

Big thank you to Lina, Kim, and Ute as well as Katja, Oliver, Nadina, and Daniel

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Cognitive Training, Creativity, and Game Intelligence in Handball

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British Library of Cataloguing in Publication Data
A catalogue record for this book is available from the British Library
Original title: *Handballspiele werden im Kopf entschieden*, © 2022 by Meyer & Meyer Verlag

The Mental Game
Maidenhead: Meyer & Meyer Sport (UK) Ltd., 2024
9781782559221

Aachen, Auckland, Beirut, Cairo, Cape Town, Dubai, Hägendorf, Hong Kong, Indianapolis, Maidenhead, Manila, New Delhi, Singapore, Sydney, Tehran, Vienna

Member of the World Sport Publishers' Association (WSPA), www.w-s-p-a.org

9781782559221
Email: info@m-m-sports.com
www.thesportspublisher.com

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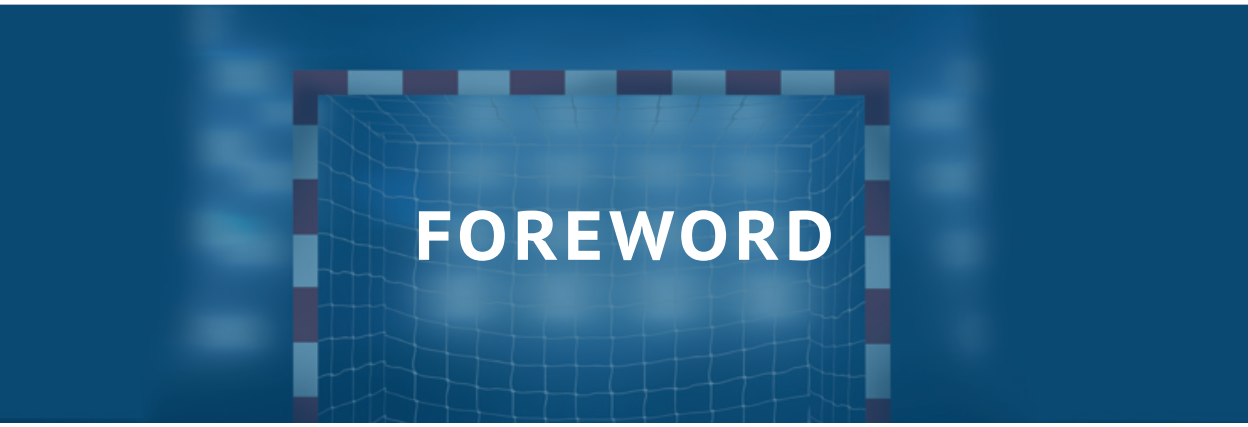


FOREWORD

At the Olympic Games in Japan in 2021, we enjoyed watching the different teams compete. I had hoped that our team would be one of them, of course. This would have been achieved through creative individual actions by outstanding individualists as well as through seemingly effortless combinations and fast and effective ball sequences by the whole team. The basis for these original solutions is cognitive components that are not put into the hand of any handball player, but which have to be honed through many hours of practice.

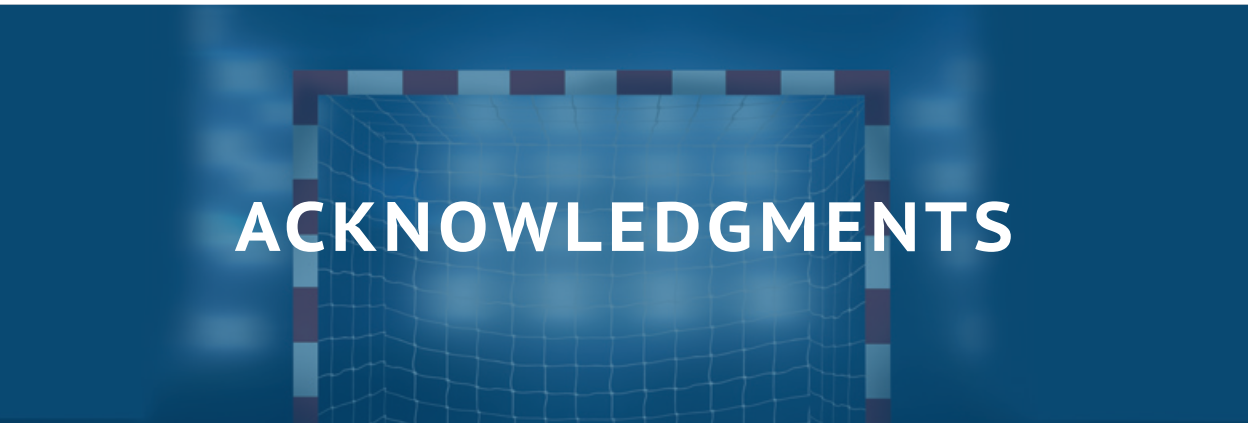
That was and is also the case with me. During my years with the Rhein-Neckar Löwen and Paris Saint-German, but of course also on the national team, my teammates and I have always very consistently trained things like perception, attention, and intelligent decisions. That's the only reason why I seem to be able to easily perceive goalkeepers accurately and attentively at the 7m penalty or on throws from my left-wing position and make the right throwing decision—or try something creative now and then; after all, a spin shot or a lob are exactly the things that our spectators and adherents want to see.

With The Mental Game, coaches are given the opportunity to devote themselves intensively to the all-too-often neglected cognitive skills. The importance of the head for ambitious A-youth teams up to the regional league or even the professional level is indisputable. I have always attributed special importance to cognitive training, no matter where I am playing. Until today, however, coaches in Germany have always had to fall back on their own knowledge or had to painstakingly search for references and game forms on cognition in handball in relevant handball magazines. This book closes the gap. With numerous game forms on the six cognitive abilities—anticipation, perception, attention, game intelligence, creativity, and working memory—it is now possible to quickly and easily get ideas for daily training practice.

I hope that this book will help to bring cognitive competencies, which have received the least attention in the training process up to now, back into focus. The greatest potential lies dormant in the cognitive area; we should learn to use it as effectively as possible. This applies to every handball player, from the district class to the national team.

Uwe Gensheimer

Captain of the German national handball team

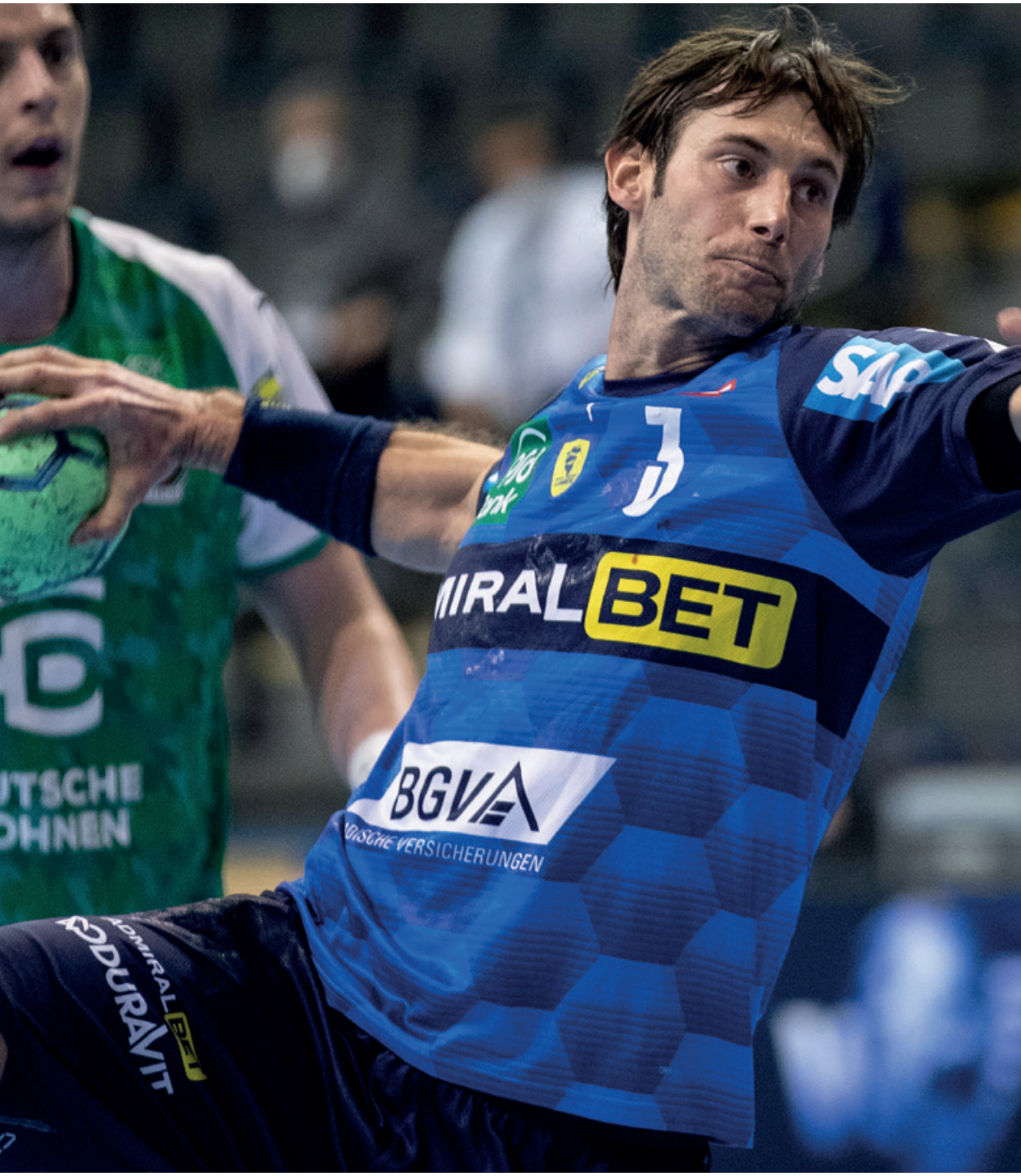


ACKNOWLEDGMENTS

We would like to thank numerous colleagues with whom we have had the privilege of researching and publishing on the topic of cognition in recent years and whose ideas we have integrated (cited, of course) (alphabetically): Dr. Philip Furley, Prof. Dr. Norbert Hagemann, Jun-Prof. Dr. Stefanie Klatt, Dr. Timo Klein-Soetebier, Prof. Dr. Benjamin Noël, Prof. Dr. Klaus Roth, Dr. Sebastian Schwab, and Prof. Dr. Matthias Weigelt. Of course, we also say thank you to all our students who made valuable contributions to the individual sub-studies.

A research program rarely results from the ideas of one individual, but rather from the collective thoughts of many in a pleasant atmosphere. In addition, we would like to thank all those who critically proofread parts of the book in advance. These are in particular (alphabetically) Prof. Dr. Norbert Hagemann, Prof. Dr. Oliver Höner, Dr. Carina Kreitz, PD Dr. Florian Loffing, Prof. Dr. Matthias Weigelt as well as Elke Weyermann, M. Sc. We would like to thank Marina Gabriel, Erika Graf, and Linnea Schneider for their help in selecting the games, creating the illustrations, and providing diverse feedback. Dr. Philip Furley provided us with central support throughout the process, which we greatly appreciate.

Daniel Memmert and Stefan König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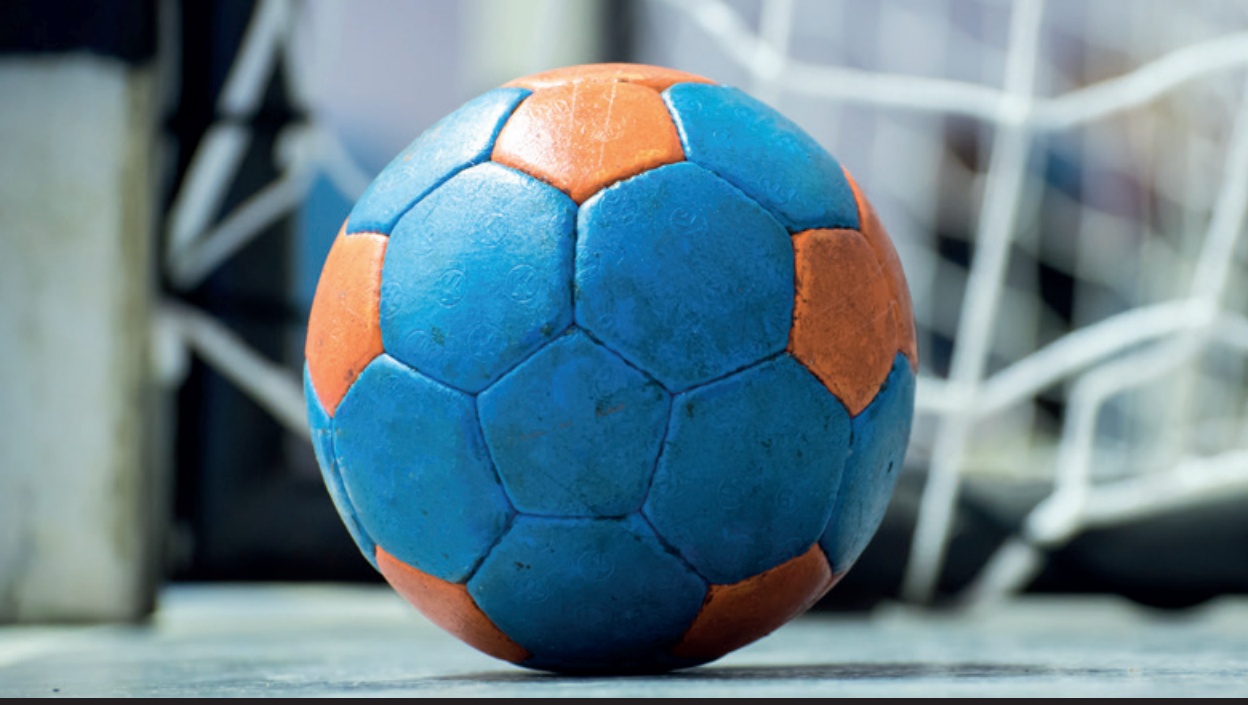


1 HANDBALL MATCHES ARE DECIDED IN THE HEAD …

Andy Schmid, Uwe Gensheimer, and Domagoj Duvnjak seem to effortlessly manage to conjure up unusual—but also technical and tactical—best solutions on the field in extremely complex situations. Successful coaches, and often even other players, mention these exceptional players' mental speed, saying that "the head is important," or "they are very quick in the head," or "they are intelligent players."

Coach Nikolaj Jacobsen (current coach of the Danish national team) also knows about these qualities: "Andy Schmid is our thinker and driver. He is very important for the team. Without him, we don't think" (www.stuttgarter-nachrichten.de/inhalt.schweizer-schmid-ist-weltklasse-der-lionel-messi-des-handballs.1058b099-a753-4396-b557-eb3ab86108c9.html).

Good examples are statements in handball magazines that talk about speed of action and handball textbooks that repeatedly emphasize that handball games are decided in the mind (Wagner, Finkenzeller, Würth, & Von Duvillard, 2014; Weigel, 2018). In addition, a whole series of studies are described in sports science journals, which underline the special importance of the coupling of perceptual skills and reaction or action speed (i.e., reactive agility).

"A physical advantage won't get you much further in the game. It's more important to make quick decisions in your head." —Uwe Gensheimer, national handball player

"But apart from that, there are various players in the men's and women's game from whom I take individual aspects as a role model and want to emulate them. These are things like: Decision-making, finding the right gaps in the attack." —Emily Bölk, national handball player

"With every win, your self-confidence increases, which enables you to determine the game yourself and to follow through with our coach's tactical instructions." —Finn Lemke, national handball player

Agility definition (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."

Common to all terms and approaches is that the mind and thus cognitive abilities seem to play a fundamental role in handball and other sports games (see also Thienes, 2020).

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 (i.e., 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.

Handball occupies a high status in sports science in general. There are many research results on this topic from different disciplines (e.g., biomechanics: Rojas, Gutiérrez-Davila, Ortega, Campos, & Párraga, 2012; handedness: Loffing, Sölter, Hagemann, & Strauss, 2015; diagnostics: Raab, Zastrow, & Häger, 2008; conditioning: Madou, 2020; Pietro, 2018; motivation & dropout: Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; motor skills: Krawczyk, Bodasinski, Bodasinska, & Slupczynski, 2018; psychology: Kajtna, Vuleta, Pori, Justin, & Pori, 2012; Ohlert & Kleinert, 2015; Strykalenko, Shalar, Huzar, Voloshinov, Yuskiv, Silvestrova, & Holenko, 2020; referees: Debanne, 2014; Morillo, Reigal, Hernández-Mendo, Montaña, & Morales-Sánchez, 2017; talent: Schorer, Faber, Koopmann, Büsch, & Baker, 2020; sleep: Jarraya, Jarraya, Chtourou, Souissi, & Chamari, 2013; Schorer, Heibült, Wilson, & Loffing, 2021; time out: Gutiérrez-Aguilar, Montoya-Fernández, Fernández-Romero, & Saavedra-García, 2016; and world state analyses: Lames, Dreckmann, & Görsdorf, 2010; Hansen, Sanz-Lopez, Whiteley, Popovic, Ahmed, & Cardinale, 2017).

Of particular relevance for this book, however, are the areas of perception, anticipation, attention, creativity, game intelligence, and working memory, with a sufficient number of publications available only for the first three cognitions. Nevertheless, even from these studies not all scientific results have been transferred into practice. This can be seen in the fact that people are amazed when Rolf Brack teaches game forms for perception and situation-appropriate decision-making, in which four different colors (different teams in relation to four goals) play a role, or when he combines brainteasers with motor responses in his training. This is considered revolutionary, but much more is possible in this respect.

For the first time, scientifically founded statements about cognitive training in handball 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:

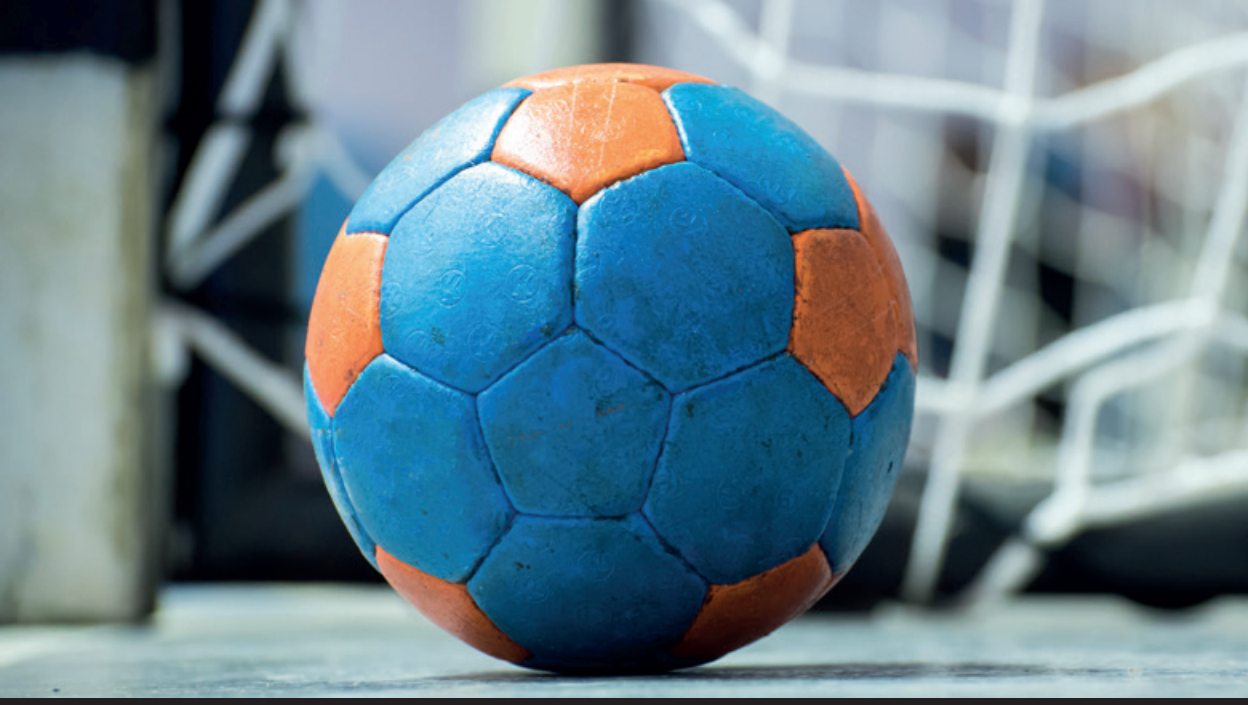
- What are the key factors that can be trained?
- What kind of models are available?
- What kind of evidence is available?

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 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 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 tests in the field (indoor or outdoor) that can be used to evaluate the athletes' skills in finding gaps, and releasing in space. These form a basic tactical foundation and are important not only in handball, but also in other sports games.

In chapter 5, training examples are given in the form of game, competition, and exercise forms for cognitive training. Coaches and clubs must be made even more aware that attention and creativity can be trained along with anticipation and perception. For this purpose, numerous examples are presented that are structured according to the content model of cognitive training, which is described in the next chapter.



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 (e.g., models, imaginations, maps, hypotheses).
4. Processes that involve an experience-controlled change in perception, leading to changeable processing strategies.