

Werner F. Helsen completed his PhD at KU Leuven in 1989. Since 2005, he is full professor at the Faculty of Movement and Rehabilitation Sciences at KU Leuven. His research and teaching involvements are in the motor control and learning field as well as in the area of performance training in team sports and football in particular. As from 1999 on, he has been appointed by FIFA and UEFA as a sports scientist and training expert for the performance training and analysis of the match officials. Since 2015, he is also in charge of the UEFA 'Fitness4Football' workshops to learn national team coaches how to use gps-based technology to makes players and the game better. In this respect, he was actively involved in 6 UEFA European Championships (2000-2004-2008-2012-2016-2020) and 3 FIFA World Cups (2002-2006-2010). Since 2018, he was also in charge of the load monitoring of the Red Devils during the preparatory training camps as well as during the World Cup in Russia (with Arne Jaspers in charge of the daily monitoring).

BIBLIOGRAPHY (Articles in internationally reviewed scientific journals)

He promoted 12 PhD dissertations and published over 150 publications in internationally reviewed scientific journals, including high-impact scientific journals in the fields of behavioral sciences and neurosciences, such as *Psychological Bulletin* (IF=6.88), *NeuroImage* (IF=6.13), *Sports Medicine* (IF=5.58). Since April 2022, Google Scholar showed 11.214 citations, H-index=51, i10-index=114.

AREAS OF RESEARCH EXPERTISE

1) Visual control of goal-directed movements

Moving an arm to contact a target is a skill employed daily in tasks as seemingly simple as dialing a phone, typing letters on a keyboard, or picking up a cup of coffee. The apparent simplicity of this type of movement belies the underlying complexity involved in the temporal organization and control of the eye-head-hand system required to accomplish such a task. The research in this research line attempts to understand how the eyes, head and hand are organized in time when a person is required to make three-dimensional movements goal-directed upper limb movements and how these movements are affected by neurological pathologies such as essential tremor and intentional tremor due to Multiple Sclerosis. An interdisciplinary approach is used integrating the movement sciences, the behavioral sciences and the neurosciences.

Five most relevant publications for this line of research:

Ellriott, D., Helsen, W., Chua, R. (2001). A century later: - Woodworth's (1899) two-component model of goal-directed aiming. *Psychological Bulletin*, 127 (3), 342-357.

Lavrysen, A., Heremans, E., Peeters, R., Wenderoth, N., Helsen, W., Feys, P., Swinnen, S. (2008). Hemispheric asymmetries in eye-hand coordination. *Neuroimage*, 39 (4), 1938-1949.

Heremans, E., Helsen, W., Feys, P. (2008). The eyes as a mirror of our thoughts: Quantification of motor imagery of goal-directed movements through eye movement registration. *Behavioural Brain Research*, 187 (2), 351-360. (

Heremans, E., Engelsman, B., Caeyenberghs, K., Vercruysse, S., Feys, P., Nieuwboer, A., Helsen, W. (2011). Keeping an eye on imagery: the role of eye movements during motor imagery training. *Neuroscience*, 195, 37-44.

Lavrysen, A., Heremans, E., Peeters, R., Wenderoth, N., Feys, P., Swinnen, S., Helsen, W. (2012). Hemispheric asymmetries in goal-directed hand movements are independent of hand preference. *NeuroImage*, 62 (3), 1815-1824.

2) A cognitive approach to skilled perception and performance

The apparent simplicity of any kind of expertise belies the underlying complexity involved in acquisition of the various perceptual-cognitive skills to accomplish an exceptional level of performance. In this research line, research is focused on the nature and nurture of expert performance. Special attention is given to the cognitive aspects of skilled perception and decision-making (how different skill levels perceive information) and performance (how the amount and structure of training sessions precedes the eventual performance level attained), and how these best transfer from the lab to the real world. Research paradigms from both kinesiology and psychology are integrated both in sport (e.g. officiating in football) and other performance domains where time constraint decision-making is a key issue. (e.g., police decision making, surgery, the military).

Five most relevant publications for this line of research:

Helsen, W., Starkes, J., Hodges, N. (1998). Team sport and the theory of deliberate practice. *Journal of Sport & Exercise Psychology*, 20, 12-34.

Helsen, W., Starkes, J. (1999). A multidimensional approach to skilled perception and performance in sport. *Applied Cognitive Psychology*, 13, 1-27.

Helsen, W., Van Winckel, J., Williams, A. (2005). The relative age effect in youth soccer across Europe. *Journal of sports sciences*, 23 (6), 629-36.

Put, K., Wagemans, J., Jaspers, A., Helsen, W. (2013). Web-based training improves on-field offside decision- making performance. *Psychology of Sport and Exercise*, 14 (4), 577-585.

Helsen, W.F., Thomis, M., Starkes, J.L., Vrijens, S., Ooms, G., MacMaster, C., Towlson, C. (2021). Leveling the Playing Field: A New Proposed Method to Address Relative Age- and Maturity-Related Bias in Soccer. *Front Sports Act Living*, 3, Art.No. ARTN 635379. [doi: 10.3389/fspor.2021.635379](https://doi.org/10.3389/fspor.2021.635379) [Open Access](#)

Bolckmans, S., Starkes, J.L., Towlson, C., Barnes, C., Parkin, G., Helsen, W.F. (2022). Leveling the Playing Field: A New Proposed Method to Address Relative Age- and Maturity-Related Bias in UK Male Academy Soccer Players. *Front Sports Act Living*, 4. [doi: 10.3389/fspor.2022.847438](https://doi.org/10.3389/fspor.2022.847438)

3) Performance enhancement and injury prevention in professional (team)sports

In this line of research, we examine the connection between external load, individual characteristics and internal load, according to the model of Impellizzeri et al. (2005). Therefore we measure in synchrony both the external load via athlete tracking equipment technology (GPS and accelerometry) as well as the internal load using heart rate monitors. In 2014, a Baekeland mandate (IWT) was funded that resulted in a co-operation between the University of Leuven, a professional soccer team in The Netherlands (AZ Alkmaar) and TopSportsLab, a spin-off of the KU Leuven that was founded in 2009 by Prof. Helsen (see also section 'Additional qualifications' at the end). This research focuses on professional football and field-hockey teams in Europe and beyond. In 2018, a second PhD Baekeland mandate was obtained as an extension of the previous project.

Most relevant publications for this line of research:

Levin, O., Vanwanseele, B., Thijsen, J., Helsen, W., Staes, F., Duysens, J. (2015). Proactive and reactive neuromuscular control in subjects with chronic ankle instability: Evidence from a pilot study on landing. *Gait & Posture*, 41 (1), art.nr. 10.1016/j.gaitpost.2014.09.005, 106-111.

Weston, M., Helsen, W., MacMahon, C., Kirkendall, D. (2004). The impact of specific high-intensity training sessions on football referees' fitness levels. *The American journal of sports medicine*, 32 (1 Suppl), 54S-61S.

Jaspers A., Brink M., Probst S., Frencken W., Helsen W. (2017). Relationships between training load indicators and training outcomes in professional soccer. *Sports Medicine*, 47(3), 533-544.

Houtmeyers, K., Jaspers, A., Brink, M., Vanrenterghem, J., Varley, M., Helsen, W. with Houtmeyers, K. (corresp. author) (2021). External load differences between elite youth and professional football players: ready for take-off? *Science and Medicine in Football*, 5 (1).

Houtmeyers, K., Vanrenterghem, J., Jaspers, A., Ruf, L., Brink, M., Helsen, W. with Houtmeyers, K. (corresp. author) (2021). Load Monitoring Practice in European Elite Football and the Impact of Club Culture and Financial Resources. *Frontiers in Sports and Active Living*, Art.No. 679824.

EDITORIAL BOARD MEMBER & REVIEWER FOR SCIENTIFIC JOURNALS

- Associate Board Member: Behavioral and Brain Sciences (1997)

- Scientific Board Member: The European College of Sport Science (2004-2012)

- Reviewer for the following journals: International Journal of Sport Psychology (1990), Science et Motricité (1995), Research Quarterly for Exercise and Sport (1997), Behavioral and Brain Sciences (1997), Journal of Sport Sciences (1999), Acta Psychologica (1999), Cortex (1999), Journal of Applied Sport Psychology (2001), Journal of Experimental Psychology: Human Perception and Performance (2001), Journal of Sport and Exercise Psychology (2001), Human Movement Science (2004), Journal of Motor Behavior (2005), Quarterly Journal of Experimental Psychology (2005), Psychonomic Bulletin & Review (2005), British Journal of Sports Medicine (2006), Sports Medicine (2007), Journal of Experimental Psychology: Applied (2008), European Journal of Sport Science (2008), Scandinavian Journal of Medicine and Science (2008), Psychology of Sport & Exercise (2008), Journal of Sports Science & Medicine (2009), Journal of Cognitive Neuroscience (2010), The Sport Psychologist (2010), Medicine & Science in Sports & Exercise (2010), Behaviour & Information Technology (2012), Psychology of Sport & Exercise (2012), Int. Journal of Sports Physiology and Performance (2012), Neuroscience (2013), International SportMed Journal (2013), Journal of Motor Learning and Development (2015), Cognitive Processing (2016), Human Brain Mapping (2018), Frontiers in Psychology (2018), Science and Medicine in Football (2018), Scandinavian Journal of Medicine and Science (218), Journal of Motor Learning and Development (2018), International Journal of Sports Science & Coaching (2018), Cognitive Processing (2019), Motor control (2019), International Journal of Sports Science & Coaching (2019), Frontiers in Psychology, section Movement Science and Sport Psychology (2019), International Journal of Occupational Safety and Ergonomics (2019), Frontiers (2019), Frontiers in Sports and Active Living, section Elite Sports and Performance Enhancement (2020), Journal of Business Research (2020), Optometry and Vision Science online journal (2020, Perception (2020)