Self-regulation of learning and the performance level of youth soccer players
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General discussion and conclusion

The purpose of the current thesis was twofold:
• To investigate the relationship between self-regulation of learning and performance level among youth soccer players aged 11 to 17 years.
• To examine how self-assessed planning, self-monitoring, evaluation, reflection, effort, and self-efficacy scores were reflected in the practice behaviors of elite youth soccer players.

Self-report, interviews, and behavioral observation were the methods employed in the current thesis. To be able to assess differences in self-assessed planning, self-monitoring, evaluation, reflection, effort, and self-efficacy scores of youth soccer players, a questionnaire (the SRS) was developed that measured self-regulated learning as a relatively stable attribute. The SRS was used to examine self-regulated learning scores of elite and non-elite, and international and national level youth soccer players (all elites). The self-regulation aspects were thought to be displayed in practice behaviors. Youth soccer coaches were interviewed to identify practice behaviors indicative of self-regulated learning. A behavioral observation study was conducted to capture behavioral correlates of self-regulated learning in elite youth soccer players.

Main findings
Findings of the present thesis indicated that self-regulation of learning is related to the performance level of youth soccer players. As self-regulation is suggested to assist players to learn more effectively (e.g., Zimmerman, 2006, 2008), it is well possible that self-regulated learning processes are important in the development of young players. In Chapter 2, the reliability and validity of the SRS was tested. Results provided evidence supporting the reliability as well as the content and construct validity of the instrument. The results of Chapter 4, in which self-regulation scores of elite and non-elite players were compared, revealed that high scores on the aspects of reflection and effort were positively associated with soccer performance level. That is, high scores on these aspects indicated a greater chance of players belonging to the group of elite players. Furthermore, elite players tended to score higher than non-elites on each self-regulation aspect. It was concluded that what youth soccer players derive from practice and competition seems at least as important as the number of practice hours. Results of Chapter 3 supported these findings, in
that elite youth soccer players had higher scores than regular youth on several self-assessed self-regulated learning aspects. Chapter 5 focused on self-regulation of learning within a group of elite players. Within this group, international and national level players were compared. Findings were in line with the results of Chapter 4: Higher reflection scores were positively associated with the level of performance. In addition, the amount of practice and competition was found to be comparable in both groups. Given the comparable amounts of practice and competition, and the differences in reflection scores, it was suggested that reflective thinking may enable international level players to benefit more from the same amount of practice than national level players. Taking together the results from Chapters 4 and 5, it can be concluded that the self-regulation aspect of reflection discriminates between performance levels, even within an elite group of players.

Findings of Chapter 4 also indicated that a relative age effect was present in both the international and national level groups, and that the relative age effect was stronger among international level players. Relative age did not affect the relationship between self-regulation of learning and performance level. The finding that international level players scored higher on reflection than national level players with equal amounts of practice, irrespective of their relative age, provided support for the assumption that self-regulated learning is related to development potential (players’ capacity to improve soccer performance) rather than maturation and experience. It was concluded that it may be more informative to use variables associated with development potential, such as self-regulated learning, rather than only discrete performance measures in soccer talent identification and –development procedures.

Players’ scores on the SRS provided valuable information about the underlying processes of self-regulated learning. However, we do not know what differences in questionnaire scores mean if they are not associated with overt behavior. Chapter 6 aimed to measure behavioral correlates of self-regulated learning by combining SRS scores with behavioral observation scores. The results emphasized that planning, self-monitoring, evaluation, reflection, effort, and self-efficacy are reflected in behaviors that refer to taking responsibility for learning. The study indicated that the practice environment (i.e., coaches, teammates) should be taken into account when investigating youth soccer players’ self-regulated learning processes. It also highlighted the importance of measuring overt behavior to gain a complete impression of players’ self-regulated learning processes.

**Theoretical considerations**

Self-regulation of learning has been defined as the extent to which individuals are metacognitively, motivationally, and behaviorally proactive in their learning process (e.g., Zimmerman, 2006, 2008). Self-regulated learners are perceived as individuals who proactively rather than reactively approach their learning tasks. This indicates that they show personal initiative, perseverance, and adaptive skills, originating from favorable metacognitive strategies and motivational beliefs (e.g., Zimmerman, 2006, 2008). Self-regulation processes are thought to help people acquire knowledge and skills more effectively (Zimmerman, 2006), meaning that they may get more out of their potential. High-level soccer players tended to have higher self-assessed self-regulated learning scores, particularly on reflection, than lower level players. This indicates
that a proactive attitude with respect to learning could help youth soccer players quicker attain high performance levels. Reflection has been suggested to be the key factor in learners’ metacognitive regulation processes (Ertmer & Newby, 1996). Findings of the present thesis provide evidence for this view, in that reflection was found to distinguish between several performance levels. The process of translating knowledge into action may, therefore, be an essential part of what players derive from practice.

Although differences in self-regulation scores were found between performance levels, particularly on reflection, there were high-level players who scored low on this variable. One explanation may be that the SRS measured self-regulation of learning in general learning situations. There is evidence pointing to the existence of domain-general psychological support skills (e.g., Eccles & Feltovich, 2008), and self-regulated learning could be one of those. However, what we are looking for is how self-regulated learning processes are reflected in soccer-specific thoughts, feelings, and behaviors, as those are the ones that determine attainment in soccer. A player may, for instance, be well able to self-regulate his learning in other domains than soccer, but if he is not interested in achievement in the particular domain, he will not use his self-regulation abilities. Furthermore, knowledge concerning one’s soccer performance is translated into domain-specific actions. These arguments seem in accordance with deliberate practice theory, because the amount of domain-specific, deliberate practice is thought to be the key factor leading to high levels of expertise (e.g., Ericsson, Krampe, & Tesch-Römer, 1993; Ford, Ward, Hodges, & Williams, 2009; Helsen, Starkes, & Van Winckel, 1998). Expertise is being developed within a certain environment, and it is this context that affords (or doesn’t afford) opportunities to learn. Interactions between individuals’ self-regulated learning capacities and the learning environment determine whether they recognize and make use of these opportunities. A soccer-specific instrument may be better able to discriminate between self-regulated learning scores of players at different performance levels, because items are more meaningful in terms of soccer practice.

Research on self-efficacy nicely illustrates this point. Bandura (1977) indicated that self-efficacy is task-specific, as previous performance accomplishments, vicarious experience, verbal persuasion, and physiological and emotional states are the four main sources of information that people use to judge their abilities to perform a task. Several studies have investigated the contextual specificity of self-efficacy (e.g., Mueller, 1992; Smith, Kass, Rotunda, & Schneider, 2006). Overall, task-specific forms of self-efficacy have been found to change due to previous performance, while more general forms of self-efficacy tended to be stable over time, irrespective of previous performance. Accordingly, Yeo and Neal (2006) have shown that self-efficacy can fluctuate over time, depending on the level and specificity of the conceptualization of self-efficacy. This may also be true for self-regulation of learning. Although individuals may have general tendencies towards learning, the learning process always is the result of the interaction between individuals and their environment. Therefore, the use of a soccer-specific instrument to measure self-regulation seems more suitable if we want to obtain results that are meaningful for soccer practice.

The metacognitive and motivational aspects of self-regulation were suggested to be reflected in practice behaviors. Overt behavior is
what coaches, teammates, and significant others perceive, indicating the importance of measuring behavior to get a complete picture of players’ self-regulation of learning processes. Chapter 6 was a first attempt to get a hold of what self-regulation of learning exactly leads to in terms of behavior. This study provided promising results and should be extended in the future.

Chapter 6 also emphasized that, given the dynamic interplay between individual and context, it is important to focus on individual differences in relation with their context. For an individual to be proactive in his learning process, the context has to afford opportunities to be self-directed. Several studies on self-regulated learning in academia have provided evidence for this notion (e.g., Cleary, Platton, & Nelson, 2008; Housand & Reis, 2008). Classroom interventions were aimed at teaching students to use evidence-based learning strategies during specific academic tasks. The interventions positively affected students’ math and reading performance (Cleary et al., 2008; Housand & Reis, 2008). Additionally, calibration training assisted students in judging their knowledge correctly, which helped improve math performance (Ramdass & Zimmerman, 2008). Practice environments emphasizing learning have also been found to be positively associated with adaptive patterns of motivation in sport, and with outcome variables such as enjoyment and well-being (e.g., Gillet, Vallerand, Amoura, & Baltes, 2010; Ommundsen & Kvalo, 2007; Ommundsen & Roberts, 1999; Pensgaard, 1999; Pensgaard & Roberts, 2002). Future research focusing on the individual and his environment can extend the results found at a group level in the present thesis.

Phillips, Button, Renshaw, and Portus (2010) presented an interesting view on talent development and the combination of individual and context, that could be applied to self-regulation of learning. They proposed a complex systems approach to talent development in which they aim to: 1) help individuals overcome constraints that prevent them to perform optimally, 2) force individuals into instability of performance so that they have to come up with new practice or game strategies, and 3) take into consideration that talented athletes have different rates of development. This kind of approach is in accordance with the ideas of Simonton (1999, 2001) discussed in Chapter 1 and is mainly focused on talent development rather than talent identification and selection. The idea of taking away constraints and challenging players to improve seems in accordance with self-regulated learning theory too, in that a context is created in which players are provided opportunities to learn and encouraged to be proactive in their learning process. It is suggested that self-regulation of learning may account for players’ coping abilities in transitional stages of learning and development through creating and making use of learning opportunities (e.g., Abbott, Button, Pepping, & Collins, 2005). In turn, they may develop a better understanding of practice or game strategies and how these fit in particular situations.

**Limitations and implications for future research**

The current thesis focused on youth soccer players’ self-regulated learning processes and performance levels. Self-regulation aspects were found to discriminate between performance levels, even within an elite group of players. Methods that were used were self-report, interviews, and behavioral observation instruments. An advantage of using multiple methods, that was particularly highlighted in Chapter 6, is that it can be examined...
how players’ planning, self-monitoring, evaluation, reflection, effort, and self-efficacy scores are reflected in what they actually do during practice. Combining methods is important because it is mainly overt behavior that is noticed by coaches, teammates, significant others, scouts, etcetera. Although this thesis contributes to knowledge about talent identification and development in soccer and other domains, there are also some limitations that must be discussed.

Reflection appeared to be the best predictor of soccer performance level, but the direction of the relationship remains unclear. On the one hand, better reflection skills may lead to more effective learning, which in turn leads to more progress and better performance. On the other hand, playing at high levels of performance may inspire players to reflect on themselves, which causes them to obtain higher reflection scores. Evidence for the first explanation may be that differences in reflection scores were already apparent from the age of 11 years. However, to investigate the direction of the relationship between reflection and performance level, the development of reflective thinking processes must be examined in combination with the development of soccer skills.

Based on the studies discussed in Chapters 4 and 5, one must be cautious to conclude that self-regulation of learning is a key process in the development of youth soccer players, because these were descriptive, correlational, did not include the learning environment, and results were found at a group level. In the present thesis, differences in self-regulation of learning have been found between performance levels of youth soccer players. Additionally, it has been argued that players who have been selected for youth academy teams have more opportunities for progression, since the youth academy environment affords high-quality training and coaching facilities. This indicates that these players have a better chance to reach the professional level. Hence, self-regulation of learning was thought to be a key process in players’ development. As the relationship between self-regulated learning and players’ development of soccer skills has not been examined, there is only indirect evidence for this statement.

A drawback of the behavior study in Chapter 6 was that we could not interview the players, asking them why they displayed certain behaviors. Therefore, we could only indicate the most logical explanations of their behaviors, without being able to verify these. An implication for future research is to develop a soccer-specific self-report instrument and combine this with player interviews and behavioral observation. The self-report instrument is assumed to accurately reflect players’ self-regulation of learning thoughts in soccer, while the interview and observation parts show how these thoughts are reflected in real-world practice behaviors.

Another interesting aspect that should be addressed in future research is the possible downside of self-regulation. One of the coaches participating in the study described in Chapter 6 pointed out that self-regulation of learning may also have a downside, in that players who think too much may start doubting their abilities. This self-doubt may in turn decrease performance. As pointed out by Leary (2004, p. 186): “Rather, the same ability to self-reflect that makes us wonderfully human and underlies the best features of civilization also creates havoc by fostering selfishness, suffering, troubled relationships, disastrous decisions, and behavior that is dangerous to ourselves and to other people”. Accordingly, putting too much effort into self-regulated learning may lead to what Baumeister
(1997) calls misregulation: The self fails to change its response into a desired outcome, although it does make an effort to change. In other words, a player expends a lot of effort into learning, but his determination to learn backfires.

**General conclusion and implications for soccer practice**

Based on the findings of the present thesis, it can be concluded that self-regulation of learning distinguishes between performance levels of youth soccer players and is reflected in behaviors that refer to taking responsibility for learning. Although the thesis provides indirect evidence, self-regulation of learning may be a key factor in players’ development towards their full potential. Reflection in particular seems to make a difference. Findings of the current thesis show that youth soccer players and coaches should focus on identifying their strengths and weaknesses, and to set goals accordingly in order to make progression. Several studies have investigated the role of reflective practice in career development or in more specific learning situations, showing that it increases self-awareness, which may positively affect development (e.g., Ghaye & Lillyman, 2004; Hanton, Cropley, & Lee, 2009; Irwin, Hanton, & Kerwin, 2004). Simply asking why certain things went right or wrong and what one can do differently the next time may already help players identify their strengths and weaknesses. Whether they indeed make progression expectedly depends on whether players indeed take action to improve their performance.

Chapter 6 showed that interpretations of self-regulation behavior may differ between coaches and players. This indicates that, in order to correctly interpret players’ behavior, coaches should make sure that they get to know their players. In this manner they can adjust their feedback to players’ needs and create a learning environment that encourages players to be proactive. Accordingly, in a study on the development of mental toughness, athletes and coaches indicated that communication is particularly important for athletes’ motivation and commitment to long-term goals so that specific training aims can be reached (Connaughton, Hanton, & Jones, 2010). This was mentioned as one of the main issues when athletes were at the same stage of development as the players who participated in the present thesis.

Furthermore, elite youth soccer seems to inherit two kinds of goals: making progression and getting selected. Therefore, players may show several behaviors because they are aware that the coach appreciates these. Results discussed in Chapter 6 of this thesis acknowledged this point. Findings by Holt and Dunn (2004) and Oliver, Hardy, and Markland (2010) also supported the view that, to become or maintain selected, players may show behaviors that a coach appreciates. In addition, being selected is important to make progression, meaning that players can have different kinds of goals. Besides love of the game and determination to succeed, obeying orders and production were mentioned as subcategories of the conforming dedication that was perceived as important for progression in youth soccer (Holt & Dunn, 2004). Coaches and practitioners should be aware that players may pursue different sets of goals.


