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J Imag. Res. Sport Phys. Act. 2015; aop

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# The Use of Imagery by Portuguese Soccer Goalkeepers

**Abstract:** The purpose of this investigation was to study the extent to which Portuguese soccer goalkeepers used imagery, and to examine if and how athletes of different ages differed in their use of imagery. Seventy soccer goalkeepers playing in the two major Portuguese soccer leagues completed the translated versions of the Sports Inventory of Mental Strategies, the Imagery Use Questionnaire for Soccer Players, the Sport Imagery Training and the Sport Imagery Questionnaire. The results showed that imagery was most used in competition than in training, preferably in its visual dimension and from an internal perspective. The results also demonstrated that athletes used imagery both for motivational and cognitive purposes, but the motivational function, namely its general-mastery component, was slightly more used and with more vivid images. After competition and when injured, under-21 athletes used imagery significantly less than their older counterparts.

**Keywords:** imagery, soccer, goalkeepers, age groups

Roger Federer (tennis), Tiger Woods (golf), Yelena Isinbayeva (track and field), Cristiano Ronaldo (soccer) and Richard Faulds (shooting) are just a few of the world's best athletes who are using imagery to improving the learning and performance of their sport skills (Moran, 2004). Imagery is defined as "an experience that mimics real experience. (...) It differs from dreams in that we are awake and conscious when we form an image" (White & Hardy, 1998, p. 389), meaning, imagery processes can occur in the absence of actual stimuli. Imagery is a "polisensory experience" (Vealey & Greenleaf, 2001, p. 249) because it combines as many senses as possible along with emotions and feelings in order to generate a vivid mental image.

Previous research has shown that imagery is easy to learn, to use and is effective for facilitating sport performance (Gregg, Hall, & Nederhof, 2005). Specifically, imagery can be used to enhance several aspects of an athletes' performance, such as the improvement of technical skills, the learning of new strategies and tactics and the development of mental processes (e.g. confidence, anxiety, motivation, arousal levels) (e.g. Moran, 2004; Munroe, Giacobbi, & Weinberg, 2000; Williams & Cumming, 2012). Several authors have researched why, when, where and how athletes use imagery (e.g. Gregg et al., 2005; Kizildag & Tiryak, 2012; Munroe-Chandler, Hall, Fishburne, & Strachan, 2007; Munroe et al., 2000; Vealey & Greenleaf, 2001). In this regard, Paivio's (1985) general analytical framework has been one of the most used frameworks to study the functional roles through which imagery influences sport performance. Paivio suggested imagery has cognitive and motivational functions, which operate at either a specific or general level, lead to four types of imagery: cognitive specific (CS), cognitive general (CG), motivational specific (MS) and motivational general (Gregg et al., 2005; Munroe et al., 2000). These four types were extended to five when Hall, Mack, Paivio, and Hausenblas (1998) separated the motivational component in motivational general-mastery (MG-M) and motivational general-arousal (MG-A) imagery. Therefore, in sport, imagery has five potential functions: (a) CG imagery involves mentally rehearsing game plans and specific strategies of play; (b) CS imagery consists in the mental rehearsal of skills; (c) MG-A imagery comprises the arousal and feelings of excitement and/or anxiety associated with performing; (d) MG-M imagery is used to imagine being in the control, mentally tough, focused and feeling confident and (e) MS imagery entails imaging

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goal achievement and accomplishment (Gregg et al., 2005; Hall et al., 1998; Moran, 2004).

Research has found that, regardless of sport, athlete's use MG-M imagery the most as compared to the four other functions (Arvinen-Barrow, Weigand, Thomas, Hemmings, & Walley, 2007; Gregg et al., 2005; Munroe-Chandler, Hall, & Fishburne, 2008; Short, Zostautas, & Monsma, 2012) while there is less consistency on the amount the other four types are used across sports. Munroe and Colleagues (2000) concluded that athletes use MS imagery to image tasks that would be needed to accomplish performance goals. These authors and White and Hardy (1998) also showed that MG-A imagery is used to control arousal and anxiety levels. Regarding imageries cognitive functions, several studies indicated that the use of CS imagery can improve motor skills performance (e.g. Driskell, Cooper, & Moran, 1994; Martin, Moritz, & Hall, 1999). On the other hand, CG imagery use was beneficial to the practice of soccer plays (Fenker & Lambiott, 1987; Munroe-Chandler, Hall, Fishburne, & Shannon, 2005).

Research investigating where and when athletes' image has found that imagery is frequently used in conjunction with competition. Athletes seem to consider that it is more important to use imagery to improve competitive performance rather than to help skill learning and development (Barr & Hall, 1992; Hall, Rodgers, & Barr, 1990; Munroe-Chandler, 2004; Munroe et al., 2000; Salmon, Hall, & Haslam, 1994). However, some studies (Munroe-Chandler, 2004; Munroe-Chandler et al., 2007; Salmon et al., 1994) revealed that athletes also use imagery in training, explicitly during and after practice.

Additionally, research also demonstrated that athletes use different imagery perspectives to enhance different aspects of skills (White & Hardy, 1995). According to Short, Tenute, and Feltz (2005) the two most popular modalities are visual and kinesthetic imagery, corresponding to external imagery perspective and internal imagery perspective, respectively. Several studies showed that the combination of external and kinesthetic imagery should enable the learner to get a superior performance (e.g.Callow & Hardy, 1997; Holmes & Collins, 2001; Salmon et al., 1994), because "it is likely that meaningful visual images are able to access the kinaesthetic elements of the representation at the nonconscious level with corresponding associated efference" (Holmes & Collins, 2001, p. 77). Nevertheless, according to Hardy and Callow (1999), kinesthetic imagery can affect performance over and above the effects of visual imagery, but this type of imagery may only be beneficial for expert performers, helping them acquire a detailed "feel" of the movements (Holmes & Collins, 2001). For non-experienced

performers it was suggested that they use external visual imagery, because it will allow them to "see" precise positions and movements, which is a more effective approach for certain types of form-based skills (e.g. Hardy & Callow, 1999; White & Hardy, 1995).

Sport imagery research has shown the type of sport an athlete's plays may lead to differences in their imagery use (e.g. Arvinen-Barrow et al., 2007; Hardy & Callow, 1999; Kizildag & Tiryak, 2012). Of particular importance in this study is how soccer players have used imagery. The first major research on imagery use in soccer investigated the motivational and cognitive functions of imagery use specific to soccer players (Salmon et al., 1994). The results showed that imagery was used more in competition than in training regardless of skill level, while the function and amount of imagery used was dependant on skill level. Specifically, elite athletes used imagery more than novice soccer players, and they used imagery for both the motivational and cognitive functions the most, while novice soccer players used motivational imagery more than cognitive imagery. Additionally, soccer players used visual and kinesthetic imagery with relatively equal frequencies. The results of this study supported Hall's (1985) contentions that individual differences must also be taken into consideration when examining an athlete's use of imagery.Building on the descriptive findings of Salmon and Colleagues (1994), Jordet (2005) designed a single case, multiple baseline study, across participants, implementing an imagery intervention programme with three elite soccer players. Results indicated that the intervention had a positive effect on athletes' visual activity. According to the author, this improvement could lead soccer athletes to prospectively control their actions, creating more practical solutions in their mind and, ultimately, performing better when they received the ball.

Another study was done to assess the effectiveness of an imagery intervention on soccer players imagery use (Munroe-Chandler et al., 2005). Building on past research this study also investigated the effect of the intervention on overall soccer performance. This study used a CG-specific imagery intervention with youth female soccer players. Results indicated that the use of CG, CS and MG-A imagery increased from the beginning of the intervention to post intervention, however, the execution of soccer strategies was not significantly enhanced by the intervention. More recently, Munroe-Chandler, Hall, Fishburne, Murphy, and Hall (2012) examined the effects of a CS imagery intervention on the soccer skill performance of young athletes (7–14 years). The results suggested that first, athletes benefited

from the intervention and second these benefits were moderated by age. Specifically, 7- to 10-year-olds performed faster following intervention, while 11- to 14-year-olds did not. Also 7- to 8-year-olds increased their use of CS imagery over time; however, no other athletes showed this increase in CS imagery use.

Research has shown that imagery is an effective technique for sport performance. Specifically, the value of imagery in soccer players has been highlighted; however, to this point, no study has investigated the effect of imagery on soccer goalkeepers' imagery use. The primary purpose of this study was to examine the four w's (where, when, why, what) of imagery use in Portuguese soccer goalkeepers'. Goalkeepers are an important population to assess as they constantly have to consider different stimuli such as opponents, team colleagues, referee, speed and ball position, judging different angles and adapting their actions to the constraints and opportunities of each play situation, Being the last line of defence and one of the few in the field that can have a dramatic game changing effect, good goalkeepers need not only flexibility and great reflexes, but also psychological skills that help them excel at their position. Based on past research it is expected that imagery would be an effective technique for goalkeepers in their attempt to improve performance in real game situations and/or in training sessions, helping to create different solutions through meaningful mental images and then transferring them to real practice.

A secondary purpose of this study was to build on the research that has focused on age, and experience, differences in imagery use and effectiveness. Although researchers have studied imagery use in different competitive levels (e.g. Cumming & Hall, 2002; Short et al., 2012) and by age in young athletes (e.g. Hall, Munroe-Chandler, Fishburne, & Hall, 2009; Munroe-Chandler, 2004; Munroe-Chandler et al., 2007), age-related differences in adult athletes with regard to imagery use have been overlooked. Therefore, the present investigation compared the imagery use of the participants based on different age groups (under 21 years old, 22–29 years old, over 30 years old). These three age groups represented the different stages of a Portuguese senior soccer players' career (i.e. initial, intermediate, final).

# Method

## Participants

A selected sample of 70 male soccer goalkeepers aged 19–35 years ($M = 25.96$, SD $= 4.36$) were enrolled in the study. They represented different competitive levels in the two major Portuguese soccer leagues. The goalkeepers were divided into three groups, according to their age: 12 of them were under-21 ($M = 20.06$, SD $= 1.07$), 39 were between 22 and 29 years old ($M = 24.99$, SD $= 2.24$) and 19 athletes were over 30 years old ($M = 31.74$, SD $= 1.62$).

## Measures

All the questionnaires presented were fully translated to Portuguese, in order to achieve the main goal of this research.

*Sports Inventory of Mental Strategies* (Murphy, Thomas, Hardy, & Bond, 1993): This scale is composed of 15 items and yields two subscale scores: training (8 items) and competition (7 items). For each item, respondents rate how often they engage in the use of imagery on a four-point scale which ranges from (1) *never* to (4) *always*.

*Imagery Use Questionnaire for Soccer Players* (Salmon et al., 1994): This 12-item questionnaire is designed to reflect imagery use in different situations (i.e. before, during and after competitions and trainings, outside sport situations, on the bench, when injured), imagery perspective (internal and external) and coaches' encouragement of athletes' imagery use. For each item, respondents rate how often they engage in the use of imagery on a seven-point scale which ranges from (1) *never* to (7) *always*. This questionnaire was adapted for soccer goalkeepers' reality, thereby eliminating existent ambiguities.

*Sport Imagery Training* (Martens, 1982): This questionnaire evaluates the vividness of visual, auditory and kinesthetic imagery, as well as the athletes' mood state, in four different situations: (a) training alone, (b) training with someone, (c) watching someone training and (4) competing. For each situation, respondents rate their imagery on a five-point scale which ranges from (1) *absence of image* to (5) *extremely clear and vivid image*.

*Sport Imagery Questionnaire* (SIQ) (Hall et al., 1998): This questionnaire is composed of 30 items designed to evaluate the frequency of the cognitive and motivational functions of imagery. To assess the frequency with which athletes use each type of imagery, answers were rated on a seven-point scale which ranges from (1) *rarely* to (7) *often*. For this study a section on vividness of the image was added to the SIQ. To assess the vividness of the images, answers were rated on a seven-point scale which ranges from (1) *easy to image* to (7) *difficult to image*.

## Procedure

Following ethical approval from the university ethics committee, coaches were contacted to request permission to contact their athletes (goalkeepers). Those athletes whose coaches gave permission were contacted and briefed on the purpose of the study. They then filled out the questionnaires individually at a place and time convenient for the athletes (usually before or after the practice session). The administration of the questionnaires lasted between 45 and 60 min.

# Results

## Descriptive statistics

The means and standard deviations for all the variables in this study are reported in Tables 1 and 2. In general, goalkeepers used imagery more in competition ($M = 3.81$, $SD = 0.71$) (especially before and during the game) than in training. When they did image in training, it was more likely to be after ($M = 4.99$, $SD = 1.66$) and during ($M = 4.56$, $SD = 1.67$) the training then before training began ($M = 4.11$, $SD = 1.69$). On the other hand, participants reported they used imagery outside of game and practice situations especially when they were on the

**Table 1:** Descriptive Statistics for Imagery Use.

|  | *M* | SD |
| --- | --- | --- |
| Competition | 3.81 | 0.71 |
| Before competition | 5.89 | 1.59 |
| During competition | 4.87 | 1.99 |
| After competition | 5.80 | 1.62 |
| Training | 3.71 | 0.66 |
| Before training | 4.11 | 1.69 |
| During training | 4.56 | 1.67 |
| After training | 4.99 | 1.66 |
| Outside game and practice | 3.76 | 1.81 |
| Before sleeping | 4.10 | 1.99 |
| When injured | 3.86 | 1.94 |
| On the bench | 4.86 | 1.61 |
| Perspective |  |  |
| Internal perspective | 5.04 | 1.59 |
| External perspective | 4.29 | 1.84 |
| Types of imagery |  |  |
| Visual | 3.84 | 0.84 |
| Auditory | 3.27 | 0.91 |
| Kinaesthetic | 3.56 | 0.84 |
| Mood state | 3.68 | 0.88 |

**Table 2:** Descriptive Statistics for Imagery Functions.

|  | Frequency | | Vividness | |
| --- | --- | --- | --- | --- |
|  | *M* | SD | *M* | SD |
| Cognitive | 4.91 | 1.15 | 3.33 | 1.23 |
| Cognitive general | 4.67 | 1.31 | 3.55 | 1.31 |
| Cognitive specific | 5.16 | 1.15 | 3.12 | 1.28 |
| Motivational | 5.26 | 1.02 | 3.13 | 1.21 |
| Motivational general | 5.18 | 1.15 | 3.15 | 1.34 |
| MG-arousal | 4.93 | 1.20 | 3.35 | 1.24 |
| MG-mastery | 5.73 | 1.09 | 2.95 | 1.44 |
| Motivational specific | 5.14 | 1.17 | 3.10 | 1.28 |

bench ($M = 4.86$, $SD = 1.61$) and before falling asleep ($M = 4.10$, $SD = 1.81$). Additionally, the participants reported a greater use of an internal perspective ($M = 5.04$, $SD = 1.59$) than external perspective ($M = 4.29$, $SD = 1.84$). Visual imagery ($M = 3.84$, $SD = 0.84$) was the most common way to create images, followed by mood state ($M = 3.68$, $SD = 0.88$); auditory imagery the least used ($M = 3.27$, $SD = 0.91$).

The descriptive statistics indicated that goalkeepers used motivational and cognitive imagery functions with almost identical frequencies ($M = 5.26$, $SD = 1.02$; $M = 4.91$, $SD = 1.15$, respectively). On the other hand, CS imagery ($M = 5.16$, $SD = 1.15$) was used more often than CG imagery ($M = 4.67$, $SD = 1.31$). Concerning vividness, subjects reported higher levels of vividness vis-à-vis the creation of MG-M-oriented images ($M = 2.95$, $SD = 1.44$) and lesser levels when engaging in CG imagery ($M = 3.55$, $SD = 1.31$) (Table 2).

## Imagery use in different age groups

To assess the effect of age on imagery use by soccer goalkeepers a one-way analysis of variance (ANOVA) was run. Follow-up tests of significant ANOVA effects were compared using the Scheffé post hoc test. The level of significance was set at $p < 0.05$.

Results indicated that there was a statistical differences in imagery use by age ($F(2,67) = 4.66$, $p = 0.01$). Post hoc analyses indicated that these differences occurred in relation to how athletes used imagery after competition, where 22- to 29-year-old goalkeepers demonstrated significantly highest frequencies of imagery use ($M = 6.13$, $SD = 1.24$), than the other two age groups (U21: $M = 4.58$, $SD = 2.15$; over 30: $M = 5.90$, $SD = 1.66$). An ANOVA was run to investigate the effect of age on imagery use during injury. The findings were significant

($F(2,67) = 3.49$, $p = 0.04$). Specifically, the over-30 group showed the highest frequencies of imagery use ($M = 4.74$, SD $= 1.88$), compared to the other two groups (U21: $M = 3.00$, SD $= 1.48$; 22–29 years-old: $M = 3.69$, SD $= 1.98$). Age did not affect imagery use in any other areas.

Inversely, under 21-year-old goalkeepers reported more difficulty than the other groups at this level, especially regarding imagery's cognitive functions. All the groups reported that CG images were the most difficult to imagine (Table 4).

**Table 3:** Age Group Comparison in Imagery Use.

|  | U21 | | 22-29 | | Over 30 | | One way anova | |
|---|---|---|---|---|---|---|---|---|
|  | **M** | **SD** | **M** | **SD** | **M** | **SD** | **F$_{2.67}$** | **P** |
| Competition | 3.72 | 0.83 | 3.86 | 0.66 | 3.75 | 0.78 | 0.25 | 0.78 |
| Before competition | 6.17 | 1.27 | 5.56 | 1.79 | 5.63 | 1.34 | 0.66 | 0.52 |
| During competition | 5.33 | 2.19 | 4.77 | 2.01 | 4.78 | 1.87 | 0.39 | 0.68 |
| After competition | 4.58 | 2.15 | 6.13 | 1.24 | 5.90 | 1.66 | 4.66 | 0.01* |
| Training | 3.71 | 0.62 | 3.77 | 0.67 | 3.58 | 0.69 | 0.49 | 0.61 |
| Before training | 4.08 | 1.38 | 4.27 | 1.84 | 3.78 | 1.58 | 0.54 | 0.59 |
| During training | 5.17 | 1.59 | 4.49 | 1.73 | 4.32 | 1.57 | 1.04 | 0.36 |
| After training | 4.75 | 2.05 | 5.28 | 1.49 | 4.53 | 1.71 | 1.48 | 0.23 |
| Outside game and practice | 4.17 | 1.53 | 3.74 | 1.82 | 3.53 | 1.98 | 0.46 | 0.64 |
| Before sleeping | 4.50 | 1.78 | 3.97 | 2.08 | 4.11 | 1.97 | 0.32 | 0.73 |
| When injured | 3.00 | 1.48 | 3.69 | 1.98 | 4.74 | 1.88 | 3.49 | 0.04* |
| On the bench | 5.25 | 1.22 | 4.80 | 1.67 | 4.74 | 1.73 | 0.43 | 0.65 |
| Imagery perspective |  |  |  |  |  |  |  |  |
| Internal | 4.50 | 1.93 | 5.26 | 1.41 | 4.95 | 1.72 | 1.08 | 0.34 |
| External | 4.17 | 1.85 | 4.28 | 1.85 | 4.37 | 1.89 | 0.04 | 0.96 |
| Imagery type |  |  |  |  |  |  |  |  |
| Visual | 3.77 | 0.77 | 3.80 | 0.85 | 3.95 | 0.89 | 0.23 | 0.79 |
| Auditory | 3.42 | 0.63 | 3.16 | 0.99 | 3.41 | 0.92 | 0.65 | 0.53 |
| Kinaesthetic | 3.63 | 0.73 | 3.53 | 0.87 | 3.58 | 0.87 | 0.07 | 0.93 |
| Mood state | 3.69 | 0.74 | 3.67 | 0.91 | 3.70 | 0.95 | 0.00 | 1.00 |

With reference to the five functions of imagery, no significant differences were found between the different age groups, either in frequency of use or images' vividness. Nonetheless, the descriptive statistics suggested that 22- to 29-year-old goalkeepers used cognitive imagery more frequently ($M = 5.02$, SD $= 1.25$) than the other age groups (U21: $M = 4.68$, SD $= 1.33$; over 30: $M = 4.85$, SD $= 1.14$). Additionally, while the most frequently used function in the 22- to 29-year-old and over-30 groups was MG-M ($M = 5.81$, SD $= 1.12$; $M = 5.87$, SD $= 1.05$, respectively), under 21-year-old goalkeepers preferred function was MS ($M = 5.74$, SD $= 0.99$). On the other hand, the CG function of imagery was the least frequently used across all age groups.

The descriptive statistics also indicated that, in general, the over-30 athletes' images (cognitive and motivational) were more vivid ($M = 3.22$, SD $= 1.14$; $M = 2.89$, SD $= 1.13$, respectively) than those of their peers.

# Discussion

The purpose of this study was to examine imagery use by Portuguese soccer goalkeepers across three different adult age groups. With respect to *where* and *when* soccer goalkeepers use imagery, the results provided support for the important role of imagery in sport performance, stressing its extensive use not only in competitive and training situations, but also in other circumstances (e.g. before sleeping, when injured). The results are in line with previous research that has shown imagery to be a valuable psychological technique in the development and improvement of athletic (e.g. Cumming & Hall, 2002; Mattie & Munroe-Chandler, 2012; Moran, 2004; Williams & Cumming, 2012).

In accordance with previous studies (Barr & Hall, 1992; Hall et al., 1990; Munroe-Chandler, 2004; Salmon et al., 1994), the participants reported using imagery more in competitive than in training or any other sport

**Table 4:** Age Group Comparison in Frequency and Vividness of Imagery Functions.

| Frequency | U21 | | 22–29 | | Over 30 | | One-way ANOVA | |
|---|---|---|---|---|---|---|---|---|
| | **M** | **SD** | **M** | **SD** | **M** | **SD** | **$F_{2,67}$** | **P** |
| Cognitive | 4.68 | 1.33 | 5.02 | 1.25 | 4.85 | 1.14 | 0.44 | 0.65 |
|   Cognitive general | 4.24 | 1.39 | 4.77 | 1.37 | 4.75 | 1.15 | 0.80 | 0.45 |
|   Cognitive specific | 5.13 | 1.28 | 5.27 | 1.13 | 4.94 | 1.14 | 0.53 | 0.59 |
| Motivational | 4.52 | 1.33 | 4.61 | 1.18 | 4.58 | 1.12 | 0.14 | 0.87 |
|   Motivational general | 5.22 | 1.23 | 5.31 | 1.13 | 5.42 | 1.11 | 0.13 | 0.88 |
|     MG-arousal | 5.22 | 1.50 | 4.81 | 1.14 | 4.97 | 1.16 | 0.55 | 0.58 |
|     MG-mastery | 5.24 | 0.96 | 5.81 | 1.12 | 5.87 | 1.05 | 1.53 | 0.22 |
|   Motivational specific | 5.74 | 0.99 | 5.03 | 1.14 | 4.96 | 1.28 | 1.96 | 0.15 |

| Vividness | U21 | | 22–29 | | Over 30 | | One-way ANOVA | |
|---|---|---|---|---|---|---|---|---|
| | **M** | **SD** | **M** | **SD** | **M** | **SD** | **$F_{2,67}$** | **P** |
| Cognitive | 3.74 | 1.28 | 3.26 | 1.37 | 3.22 | 1.14 | 0.80 | 0.45 |
|   Cognitive general | 4.15 | 1.22 | 3.49 | 1.38 | 3.29 | 1.17 | 1.71 | 0.19 |
|   Cognitive specific | 3.33 | 1.34 | 3.03 | 1.35 | 3.16 | 1.11 | 0.27 | 0.77 |
| Motivational | 3.32 | 1.66 | 3.16 | 1.36 | 2.89 | 1.13 | 0.57 | 0.57 |
|   Motivational general | 3.43 | 1.43 | 3.19 | 1.40 | 2.89 | 1.12 | 0.74 | 0.48 |
|     MG-arousal | 3.40 | 1.43 | 3.43 | 1.25 | 3.15 | 1.11 | 0.33 | 0.72 |
|     MG-mastery | 3.46 | 1.42 | 2.96 | 1.55 | 2.62 | 1.13 | 1.26 | 0.29 |
|   Motivational specific | 3.10 | 1.53 | 3.21 | 1.28 | 2.90 | 1.14 | 0.37 | 0.69 |

situation, using it especially just before the competition (Hall et al., 1990; Munroe-Chandler et al., 2007). Munroe and Colleagues (2000) stress that this can help soccer goalkeepers "feel more self-confident and in control of their arousal and stress levels" (p. 132).

On the other hand, it should be noted that in spite of the fact that soccer goalkeepers reported using imagery most in competitive situations, they also mentioned its use during and after training situations. Salmon and Colleagues (1994) found similar results with soccer players. This suggests that soccer goalkeepers view imagery as a valuable technique to learn, improve and "train" technical and tactical soccer skills (Hall, 2001; Shoenfelt & Griffith, 2008; Vealey & Greenleaf, 2001; Williams & Cumming, 2012).

Still regarding this issue, soccer goalkeepers' imagery use outside of the game and practice situations contrasts with the results of Salmon and Colleagues' (1994) study, in which this was one of the preferred moments in the use of imagery. These results are in line with those of Munroe-Chandler and collaborators (2007) who suggested that imagery can and must be used in different settings and moments so that athletes can amplify its benefits (e.g. anxiety and arousal control, confidence and focus, technical and tactical abilities).

Soccer goalkeepers also reported a high use of imagery when they were "on the bench", a result consistent with Salmon and Colleagues' (1994) investigation, in which

soccer players also stated using imagery when they were not playing. A possible explanation for this result is that when they were on the bench they had the opportunity to see their teammates and their opponents in action, retrieving information from their memory in order to improve their anticipation behaviour (Smeeton, Hibbert, Stevenson, Cumming, & Williams, 2013) and tactical skills. This is extremely important for goalkeepers as the backup goalkeeper often spends an entire season on the bench during games. Being able to use imagery during this time is an excellent way for a backup goalie to stay engaged in the sport and to be ready to start playing when necessary.

The content of athletes' images refers to *what* and *why* athletes are imaging. To understand the imagery content is necessary to consider the perspective of the formed images and imagery functions. Concerning imagery perspective, internal imagery was used more than external imagery. Holmes and Collins (2001) and White and Hardy (1995) argued this perspective tends to be more effective on performance outcomes because it generates higher physiological responses, more effective learning, and, ultimately, better performance outcomes. Notwithstanding, Hardy and Callow (1999) found that external imagery was superior to internal in regard to task acquisition, being a more effective approach to certain types of skills and allowing the athlete to "see" precise positions and movements. On the other hand, these authors also advocated that internal imagery may be more

beneficial once performers have acquired a certain degree of expertise, supporting the results of the present study.

Finally, the results showed that soccer goalkeepers preferred visual imagery. Previous studies found similar results (Callow & Hardy, 2004; Gregg et al., 2005; Short et al., 2005). On the other hand, this finding is somehow controversial regarding the results on imagery perspective, since, generally, external imagery is predominantly visual and internal imagery involves kinesthetic components (i.e. feeling the movement) (Salmon et al., 1994).

With regard to *why* athletes used imagery (i.e. the functions of imagery), the fact that soccer goalkeepers used motivational and cognitive imagery functions with identical frequencies, suggests that goalkeepers tried to maximize the use of imagery, regardless of its function. Nevertheless, consistently with several investigations (e.g. Gregg et al., 2005; Kizildag & Tiryak, 2012; Mattie & Munroe-Chandler, 2012; Munroe-Chandler et al., 2008; Short et al., 2012), motivational imagery was not only slightly more used than cognitive imagery, but also that its images were more vivid. This suggests that soccer goalkeepers employed imagery to motivate and control themselves, as well as to keep focus and be mentally tough under the pressure of the game. As Salmon and Colleagues (1994) put it, goalkeepers used motivational images to "energize themselves to play and practice the game of soccer" (p. 130).

Another interesting result concerns the more frequent use of CS than CG imagery, corroborating findings from previous investigations (e.g. Cumming & Hall, 2002; Kizildag & Tiryak, 2012). It is generally accepted that CS imagery facilitates the learning and performance of motor skills (Munroe et al., 2000). For that reason, it can be seen as normal that goalkeepers employed CS imagery to focus and practice on their specific position skills.

Pertaining to the comparison of imagery use between different age groups, there were few differences found between under-21, 22–29 and over-30-year-old athletes. In other words, the present investigation seems to corroborate, at least partially, the statements of several authors who argued that imagery is a psychological skill used by athletes of all ages, and that this variable does not significantly affect their use of imagery (e.g. Barr & Hall, 1992; Hall et al., 1998; Mattie & Munroe-Chandler, 2012).

However, the two differences that were observed deserve to be closely analysed. First, the fact that the youngest goalkeepers (i.e. under-21) reported using imagery significantly less in the moments following the competition than the 22- to 29-year-old group may be explained by the youthfulness characteristic of novice athletes, which does not allow them to reflect on their actions appropriately. In Vealey and Greenleaf's (2001)

words "using imagery at this time [after competition] facilitates increased awareness of what actually happened during the competition" (p. 266). Hence, after a game would be an appropriate time to use imagery, as an exercise to reflect and evaluate performance, identifying strengths and weaknesses, however, younger athletes might not be fully prepared to associate all the game components and procedures through a correct use of imagery techniques.

Additionally, when injured, over 30-year-old soccer goalkeepers used imagery significantly more than under-21 athletes. This finding is consistent with Salmon and Colleagues' (1994) study. Concurrently, Vealey and Greenleaf (2001) stated that "imagery might be a useful substitute for physical practice when athletes are fatigued, overtrained, or injured" (p. 256). Conceivably older and more experienced goalkeepers were more aware that, when injured, they could use visualization and imagery training as a part of their rehabilitation programmes to keep physical skills from deteriorating, running drills and workouts just as though they were physically performing them (Vealey & Greenleaf, 2001). It should be noted that injured athletes should combine various imagery strategies, such as rehabilitation goal-oriented imagery and positive mind, because as soon as they begin to use rehabilitation imagery, the more proficient and capable they become the more benefits can be derived (Munroe-Chandler, 2004).

In conclusion, the present study proposed to analyse the use of imagery in soccer goalkeepers of various ages. Overall, the findings suggest that Portuguese soccer goalkeepers may need education on the importance and the benefits of a regular and systematic use of imagery techniques, because they are already using imagery extensively, but are they using it effectively? Do they know how to use it properly? Imagery education and regular practice should be integrated in training sessions, simultaneously with soccer skills and drills, in order to help soccer goalkeepers using this psychological skill more effectively and accurately. Hall (2001) corroborates this idea, and argues that athletes should be encouraged to use imagery in practice, simultaneously with technical and tactical development. The integration of imagery in the training process will allow athletes to better understand and to better respond to the increasing demands of the competition.

One particular drawback to this issue was the low frequency of imagery used before training sessions, which might be explained by the lack of information that soccer goalkeepers have about the practice session about to begin. A possible recommendation to coaches is to transmit to athletes the training contents, structure and organization previously, in order to help them

mentally prepare for each practice session. Furthermore, various suggestions can be made in order to improve investigation on the topic of imagery in soccer, in general, and imagery in goalkeepers, in particular.

The data of this study may serve as a useful tool for developing more specific and effective imagery interventions. For example, further investigation should now examine the efficacy of the imagery techniques on soccer goalkeepers' performance. It also would be interesting to consider questioning other soccer players' about their imagery use, according to their specific position and role in the game field. On the other hand, it could be interesting to compare the same specific position (e.g. goalkeeper) in different sports (e.g. handball, hockey, etc.). Therefore, in order to improve imagery effectiveness future researches should consider investigating the development of individualized and personalized intervention programs in soccer as well as in other team sports, incorporating specific imagery techniques and exercises according to athletes' different positions and roles. At this level, the combination of questionnaires with individual interviews would help researchers and practitioners to deeply assess athletes' opinions and understandings about imagery, elucidating, for example, if specific field positions in soccer (and other team sports) require similar or different intervention methodologies.

As highlighted above, the results of this study represent an interesting start to the study of imagery use by soccer goalkeepers; however, there are a couple of limitations that should be noted. First, the sample size was restricted and limited only to Portuguese context. Although participants were representing all the teams of the two major Portuguese soccer leagues, the number of participants doesn't allow to fully analyse and generalize the results. To extend the sample to other European and World soccer leagues would be beneficial for a more comprehensive analysis, because it would allow comparison between different sport educations, cultures and settings. Second, researchers did not assess whether or not soccer goalkeepers had previously been taught how to use imagery. Controlling this variable is important for further understand of any differences in imagery use found in future research.

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