The effects of coaching behaviors on motivation in handball players

- An analysis of the effects of verbal and non-verbal coaching behaviors on motivation on the grounds of self-determination theory

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Abstract

Background and Purpose: Using self-determination theory as an analytical framework, the present study investigated the influence of coaching behaviors in handball on different types of motivation of the players. As several authors have outlined the importance of the coach as a social factor which has an influence on motivation and its mediators, the three main goals of the study were to (1) analyze the correlation between observed coaching behaviors and motivation of athletes based on self-determination theory, (2) analyze the perceived coaching behaviors and their relation to motivation, and (3) compare the observed coaching behaviors with the coaching behaviors as perceived by the players.

Method: Three different instruments were used in order to assess the relationship between coaching behaviors and motivation. An observational design of two observers was used to count every displayed coaching behavior of seventeen coaches during one game observation and one training observation according to an assessment system with ten categories, the Coaching Behavior Assessment System (CBAS). The perceived coaching behaviors were measured by a questionnaire, the Coaching Feedback Questionnaire (CFQ). The different types of motivation were assessed with the sport motivation scale (SMS).

Results: One hundred seventy-seven handball players of seventeen teams returned their questionnaires (response rate 99.44%). The results indicated few significant relationships between coaching behaviors and motivation and they were weak and insignificant for most items. Exceptions were mostly related to the coaching behavior Reinforcement and different types of motivation.

Conclusion: The results indicate that for the present sample a relationship between coaching behaviors (perceived and observed) and athletes’ motivation was not present. Different levels of assessment of the study design, i.e. observations on the situational level and questionnaires assessing motivation and perceived coaching behaviors on the contextual level, may have had an influence on the results. Further research is needed on other social factors that may influence the different types of motivation as proposed by self-determination theory.
Table of Contents

Abstract ............................................................................................................................ II
Table of Contents .............................................................................................................. III
List of Figures .................................................................................................................. IV
List of Tables ................................................................................................................... IV
1 Introduction .................................................................................................................. 1
  1.1 Defining the task........................................................................................................ 1
  1.2 Review of literature for the study .......................................................................... 4
    1.2.1 Validity of instruments and findings of related studies .................................... 5
    1.2.2 Potential influences on motivation on different levels ..................................... 6
  1.3 Coaching assessment tools ..................................................................................... 7
  1.4 Tools to assess sport participation motivation ....................................................... 9
2 Methods ........................................................................................................................ 12
  2.1 Overview of study designs ...................................................................................... 12
  2.2 Participants ............................................................................................................. 12
  2.3 Recording procedure ............................................................................................. 15
    2.3.1 Recording procedure and categorization ......................................................... 16
    2.3.2 Distinction between different behaviors and categories ................................... 17
    2.3.3 Measurement of self-reported motivation and perceived coaching behavior ...... 18
  2.4 Translation procedure of the questionnaires ........................................................... 19
  2.5 Statistical Analysis ................................................................................................. 19
3 Results .......................................................................................................................... 21
  3.1 Differences in coaching behavior between games and training sessions ............... 21
  3.2 Reliability of Sports Motivation Scale items .......................................................... 22
  3.3 Correlations among Sports motivation scales (SMS) .............................................. 22
  3.4 Relationships between perceived coaching behaviors and observed coaching behaviors ...... 23
  3.5 Relationships between observed coaching behaviors and different types of motivation ...... 23
  3.6 Relationships between perceived coaching behaviors and different types of motivation ...... 24
  3.7 Regression analysis ............................................................................................... 25
    3.7.1 Regression analyses of observed coaching behaviors, potential confounding variables and different types of motivation ....................................................... 25
    3.7.2 Regression analyses of perceived coaching behaviors, potential confounding variables and different types of motivation ....................................................... 27
4 Discussion ..................................................................................................................... 30
  4.1 Findings of the study and limitations of the CBAS results ..................................... 30
  4.2 General limitations of the study .......................................................................... 34
  4.3 Further research recommendations ...................................................................... 37
Bibliography ................................................................................................................... 39
Table of Appendices ...................................................................................................... 54
List of Figures

Figure 2: Mageau and Vallerand’s (2003) motivational model of the coach-athlete relationship................................................................. 2

List of Tables

Table 1: Significant correlational differences between observed coaching behaviors (CBAS) recorded during training sessions and games.................................................. 21
Table 2: Correlations among Sports Motivation Scales (SMS)................................................................. 22
Table 3: Significant correlations between observed coaching behaviors and perceived coaching behaviors........................................................................... 23
Table 4: Correlations between observed coaching behaviors and different types of motivation ........................................................................ 24
Table 5: Correlations between perceived coaching behaviors and different types of motivation ........................................................................ 25
Table 6: Regression analyses of the ten observed coaching behaviors, the six potential confounding variables and the seven different types of motivation ......................... 27
Table 7: Regression analyses of the seven perceived coaching behaviors, the six potential confounding variables and seven different types of motivation ......................... 28
1 Introduction

1.1 Defining the task

Participation in exercise and sport has been valued as an important way to increase personal fitness and emotional well-being (Biddle & Mutrie, 2001) by a high number of researchers and health practitioners. As sport participation is a nearly universally acknowledged way to improve personal fitness (Vuori, 1995), the question why some people behave in certain ways while others do not has been the central question of behavioral science for a long time (Mallett, Kawabata, Newcombe, Otero-Ferero, & Jackson, 2007). Therefore, the reasons for engaging in any particular behavior are at the center of interest for everyone empowered to influence others like teachers, sport coaches or parents in order to motivate people to act in desired ways, for example in the sports or educational context. The determinants for reasons to act, which can also be named motivation, are of interest mainly because of two reasons: The explanation of past and actual behavior as well as the prediction and active influence of future behavior. In order to achieve this, different motivational theories have been proposed. One of the theories which is especially useful for the context of sport is self-determination theory (Deci & Ryan, 1985a, 2000), because it implies social and cognitive factors and different types of motivation as well as behavioral consequences. Self-determination theory differentiates between intrinsic motivation, extrinsic motivation and amotivation as well as the extent to which these different types of motivation are perceived as autonomous and emanate from the self (Deci & Ryan, 1985b). In line with self-determination theory, a four-stage causal sequence has been proposed by Vallerand (1997) which contains the sequence of: Social factors, which have an influence on psychological mediators, which again have an influence on types of motivation which finally lead to behavioral consequences.

In the context of sport, the coach has been identified as an influential social factor at all competitive levels (e.g. Horn, 2002; Smoll, & Smith, 2002; Barnett, Smith, & Smoll, 1992; Bredemeier & Shields, 1993; Scanlan, 1986). The way a coach structures practice and game situations, his way of making decisions, the quality and quantity of feedback he provides in response to athletes’ performances, the relationships he establishes with athletes as well as his leadership style can all have an impact on athletes’ behaviors, cognitions, and affective responses (Amorose, 2007; see also Figure 1).
1 Introduction

Different motivational models have been proposed (see Appendix 14; 15; 16). According to these, coaches can influence the learning processes of their athletes, their enjoyment during participation and the sense of competence and self-determined motivational orientation they develop (Chelladurai, 1993; Horn, 1987, 2002; Mageau & Vallerand, 2003; Murray & Mann, 2001; Smoll & Smith, 2002).

As coaching behaviors can also “lead to negative achievement-related and psychological outcomes (e.g. poor performance, low self-esteem, high levels of competitive anxiety and burnout)” (Amorose, 2007, p. 209), the question arises which coaching behaviors facilitate and which behaviors decrease the athletes’ motivation. A sports coach in team sports as well as in individual sports is in an unequal power situation with his athletes, which gives him the privilege of making decisions that effect the whole motivational climate (Ames, 1992a). Therefore coaches are made responsible for different goals to be achieved and need to ensure the development of different aspects as outlined by Martens (2004): Recreational sports have an emphasis on fun, learning and participation by all, whereas competitive sports focuses on winning, performance and participation by the best (Martens, 2004, p. 21). Because of this responsibility, coaches at the recreational level as well as coaches involved in competitive or elite level sports should have an interest in developing a motivational climate for their athletes which facilitates the successful achievement of these different outcomes.

Coaching behaviors have been found to have strong implications on the recreational level in relation to dropout (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003),
1 Introduction

enjoyment and fun (Simons, Dewitte, & Lens, 2003), and persistence (Gagné, Ryan, & Bargmann, 2003). However, links between coaching behaviors and concentration (Kowal & Fortier, 1999) and coaching behaviors and effort and performance (Simons, Dewitte, & Lens, 2003) make clear that for a coach in order to achieve the desired outcomes an effective “usage” of his coaching behaviors is equally important in competitive sports where performance is of higher importance (Martens, 2004).

Keeping the many positive impacts of physical activity on several biological functions as well as its role in the prevention of overweight and obesity (Wing, 1999; Clark & Blair, 1988) in mind, it becomes clear that a coach can have an important indirect influence on the aforementioned consequences through his role as a social factor. This influence is also apparent when an increase in performance is desired as in a sports context where achievement and performance are prevalent. Acknowledging this influence of the coaching process, it becomes clear that the high dropout rates in recreational sport participation especially at the beginning of adulthood (Sarrazin, Boiche, Pelletier, 2007, p. 229) as well as the high levels of burnout in competitive sports (Klinger, 1975) must lead to the assumption that the responsible coaches are either not aware of how the motivational climate they create and their displayed coaching behaviors may influence their athletes’ motivation, which consequently can lead to the undesired outcomes described, or, which would be equally bad, they might be unable to change their coaching behavior.

The aim of the following thesis therefore is to analyze the impact of different coaching behaviors on different types of motivation which differ in their extent of perceived self-determination (Deci & Ryan, 1985b). Secondly it will be analyzed whether it is rather the impact of perceived coaching behaviors or the impact of observed coaching behaviors which leads to the fulfillment of the three basic needs of relatedness, competence, and autonomy which may increase or decrease the amount of self-determined forms of motivation. This analysis will be carried out in the context of and based on the results of this analysis, recommendations for coaching behaviors in the given context will be attempted in order to promote the desired types of more self-determined motivation and beneficial outcomes such as better performance, lower drop-out rates or more enjoyment during sport participation.

To the knowledge of the author no study on motivation which compromises the basic tenets of self-determination theory was carried out with senior, male handball players of different playing levels before. As the majority of research examining motivation from a self-determination theory point of view focuses on youth and university sports participants
1 Introduction

(Treasure, Lemyre, Kuczka, & Standage, 2007), it was decided to restrict the participants to those who are playing and training in organized club structures.

1.2 Review of literature for the study

Self-determination theory (SDT) is a theory on motivation which focuses on the degree to which individuals perceive themselves to be the origin of their own actions and choices (Deci & Ryan, 1985a, 2000). “The basic assumption of SDT is that people are innately and proactively motivated to master their social environment” (Mallett et al., 2007, p. 601). In order to master one’s social environment, three basic needs which function as “nutriments essential to growth, integrity, and well-being” (Deci & Ryan, 2000, 2007, p. 13; Ryan, 1995) have to be fulfilled. They comprise the need for competence, the need for autonomy, and the need for relatedness. These three needs are at the center of cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1980, 1985b, 1991, 2000), which is one of the subtheories of the meta-theory SDT. The need for competence can be understood as a human desire to feel responsible and competent in producing desired outcomes and preventing undesired ones. (Connell & Wellborn, 1991; Deci, 1975; Deci & Ryan, 1985b; Harter, 1978; Vallerand, 2007; White, 1959). The need for autonomy describes the desire of feeling to be the origin of one’s action (deCharms, 1968; Deci, 1975, 1980; Deci & Ryan, 1985a; Vallerand, 2007). The need for relatedness is the desire to be part of a social group when engaging in an activity (Baumeister & Leary, 1995; Deci & Ryan, 2000; Richer & Vallerand, 1998: Ryan, 1993; Vallerand, 2007).

Deci and Ryan (2000) suggest that these needs are universal and the desire to fulfill them is inherent in every individual. However, one of the fundamental differences of self-determination theory in contrast to other motivational theories such as regulatory focus theory (Higgins, 1997) or expectancy theory (Vroom, 1964) is the fact that it does not only differentiate between intrinsic, extrinsic and amotivation but also offers a more complex model of different degrees of autonomy in extrinsic motivation.

Intrinsic motivation describes a state where an activity is performed for its own sake, because it is perceived as interesting and satisfying in itself without the help of any external forces (Deci, 1971). A state of motivation produced by external forces would be described as extrinsic motivation. (Deci & Ryan, 2002) Amotivation is characterized by the absence of any extrinsic and intrinsic forces and thus “not having either intention or energy directed toward action” (Deci & Ryan, 2007, p. 6).
1 Introduction

In line with its two subtheories, cognitive evaluation theory (Deci & Ryan, 2002) and
gorganismic integration theory (Ryan & Connell, 1989), self-determination theory also
differentiates the degree to which extrinsic motives are perceived to be autonomous and
volitional (Deci & Ryan, 2002). For this reason, extrinsic motivation is subdivided into four
different degrees of perceived autonomy, where integrated regulation represents the most
autonomous form of extrinsic motivation on a continuum where each of the following
regulations, i.e. identified, introjected and external regulation all represent decreasing degrees
of perceived autonomy, with external regulation representing the type of extrinsic motivation
with the lowest degree of perceived autonomy (ibid.).

Consequently, the probably most important tenet of self-determination theory states
that the higher the fulfillment of the three fundamental needs for competence, autonomy, and
relatedness, the more the reasons for an activity are perceived as self-determined with an
increased likelihood of intrinsic or integrated extrinsic motivation (Deci & Ryan, 1980).

Ryan and Connell (1989) additionally state that an interplay between intrinsic and
extrinsic motives exists, which makes an analysis of these different kinds of motivation
necessary when aiming to analyze the overall quality of motivation and which also makes it
important to analyze the influence of coaching behavior on all different motivational concepts
and not only one in particular.

1.2.1 Validity of instruments and findings of related studies

The self-determination taxonomy of motives, the continuum of relative autonomy, and the
predicted consequences have been validated in different cross-cultural settings in the field of
sports (Matsumoto, Takenaka, & Takaya, 2003; Mullan, Markland, & Ingledew, 1997;
Wilson, Rodgers, Fraser, & Murray, 2004). Several studies have reported the positive
consequences associated with intrinsic motivation on behavioral outcomes such as persistence
(Markland & Ingledew, 2007, p. 29) and “intrinsically motivated individuals are more likely
to choose to participate and work hard when extrinsic rewards or reinforcements are not
available, experience lower levels of performance-related anxiety, and exhibit greater levels
of skill learning relative to those with a more extrinsic motivational orientation” (Amorose,
2007, p. 210; compare also Vallerand, 1997; Vallerand & Losier, 1999; Weiss & Ferrer-Caja,
2002). Additionally, autonomous motivation which can be considered synonymous with self-
determined motivation (Ryan & Deci, 2007; Pelletier & Sarrazin, 2007) was found to be
associated with positive attitudes towards sporting behavior (Vallerand & Losier, 1994),
positive emotions (Frederick, Morrison, & Manning, 1996; Li, 1999), flow (Kowal & Fortier,
Introduction

1999, 2000), and physical activity intentions (Kowal & Fortier, 2005; Standage, Duda, & Ntoumanis, 2003; Wilson & Rodgers, 2004) as well as with behavioral outcomes like sport persistence (Pelletier, Fortier, Vallerand, & Briere, 2001; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002), leisure-time physical activity (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003), exercise adherence (Fortier & Grenier, 1999; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997), stage of physical activity behavior change (Fortier et al., 2006; Ingledew, Markland, & Medley, 1998; Mullan & Markland, 1997), and physical fitness (Wilson, Rodgers, Blanchard, & Gessell, 2003). However, research with Bulgarian athletes also indicated positive effects on performance of less self-determined forms of motivation (i.e. introjected regulation and external regulation) in certain conditions (Chantal, Guay, Dobreva-Martinova, & Vallerand, 1996) as can be found in highly competitive and controlling structures which emphasize external incentives and pressures to compete (Treasure et al., 2007).

1.2.2 Potential influences on motivation on different levels

The influence of the social context, such as the political system, as opposed to a particular coaching behavior, such as praise in response to a player’s positively judged performance, shows that different levels of social factors exist. Vallerand (2001) proposes a model with three different social levels of motivation in order to have a “more refined understanding of motivational processes involved in human behavior” (Vallerand, 2007, p. 260). This hierarchical model of intrinsic and extrinsic motivation (HMIEM) (Vallerand, 1997, 2001) implies (1) global factors which are present even in different contexts such as a personality trait which is considered to be stable over time (Vallerand, 2007). (2) Contextual factors comprise all factors present in one particular life domain. The three typical life domains on the contextual level are education, leisure and interpersonal relationships (Blais, Vallerand, Gagnon, Briere, & Pelletier, 1990). The third social factor level besides the global and the contextual level is the situational level which “refers to the motivation individuals experience when engaging in a specific activity at a given moment in time” (Vallerand, 2007, p. 260). This situational level refers to specific actions, for example a particular task such as shooting on the goal during a training session. Consequently motivation has to be considered on all three levels, as these levels are proposed to be interconnected, when analyzing the impact of a social factor such as the coaching behavior on perceived motivation. All three different levels described before are also related to different amounts of motivation for each individual. For
example a highly self-determined individual on the contextual level of handball has a very high likelihood of also being highly self-determined motivated on the situational level, for example during one particular exercise. Additionally an individual whose personal trait it is to be mainly motivated by less self-determined extrinsic types of motivation on the global level, also has a high likelihood of displaying this kind of motivation on the contextual level, for example in school or during sports. (Appendix 14)

Therefore it becomes evident that the coaches’ role which has been identified as being particularly important in sports (Horn, 2002; Weiss & Ferrer-Caja, 2002) has a direct influence both on the contextual level through his position (i.e. leadership style etc.) in a given context as well as on the situational level through particular behaviors displayed at a given point in time (i.e. through praise, punishment, encouragement, non-verbal communication etc.). However, although the coach is in a position which is restricted to the actual context of sport and has no direct effect on global motivation, bottom up effects of motivation were found to be present (Vallerand, 2007) in that contextual motivation has a bottom-up effect on the global motivation.

The overwhelming amount of reported benefits of more intrinsically or autonomously perceived motivation in different contexts such as psychological need satisfaction, leisure-time physical activity behavior, teacher ratings of motivated behavior, concentration, changes in subjective vitality and obviation of negative affects (Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Ntoumanis, 2005; Standage, Duda, & Ntoumanis, 2003, 2006; Gagné, Ryan, & Bargmann, 2003; Pelletier, Fortier, Vallerand, & Briere, 2001; Reinboth & Duda, 2006; Reinboth, Duda, & Ntoumanis, 2004) make clear that an analysis of the coaching behaviors is of paramount importance when trying to analyze its influence the diverging different types of self-determined motivation.

Based on these findings, the present study will not focus on the behavioral consequences but rather on the perceptions of self-determination of the athletes which may be increased or decreased through the coaching behaviors and on measurement issues of how to assess the various underlying concepts of motivation.

1.3 Coaching assessment tools

As mentioned before, the coach in his unique influential position for decisions on tactics, training session structuring, verbal and non-verbal feedback to players’ actions (Appendix 15;
1 Introduction

has been identified as a powerful social factor influencing players’ motivation (Amorose, 2007). For this reason, different assessment tools have been developed in order to measure different coaching behaviors.

The Coaching Behavior Assessment System (CBAS) (Smith, Smoll, & Hunt, 1977) (see Appendix 22 for German Version) is a behavioral observation approach which allows trained observers to code verbal and non-verbal feedback of the coach in practice and game situations. The CBAS consists of twelve behavioral categories which are (a) reinforcement (a positive, rewarding action, verbal or non-verbal, to a good play or good effort), (b) non-reinforcement (failure to respond to a good performance), (c) mistake-contingent encouragement (encouragement given to an athlete following a mistake), (d) mistake-contingent technical instruction (instruction or demonstration given to an athlete to explain how to correct a mistake), (e) punishment (negative reaction, verbal or non-verbal, following a mistake), (f) punitive technical instruction (technical instruction following a mistake given in a punitive or hostile manner), (g) ignoring mistakes (failure to respond to an athlete’s mistake), (h) keeping control (reactions intended to restore or maintain order among team members), (i) general technical instruction (spontaneous instruction in the techniques and strategies of the sport, not following a mistake), (j) general encouragement (spontaneous encouragement that does not follow a mistake), (k) organization (administrative behavior that sets the stage for play by assigning duties or responsibilities), and (l) general communication (interactions with players unrelated to the game) (Barnes, 2003).

These coaching behaviors can be classified into (a) reactive and (b) spontaneous behaviors. The reactive behaviors are those which immediately follow a players’ action which is either a desired or undesired behavior. These reactive behaviors include reinforcement, non-reinforcement, mistake-contingent encouragement, mistake-contingent technical instruction, punishment, punitive technical instruction, ignoring mistakes, and keeping control (Smith et al., 1977). The spontaneous behaviors are general technical instruction, general encouragement, organization, and general communication. These behaviors are not associated to and therefore not reactive with preceding events (Smith et al., 1977).

However, in the previous years different or adapted versions of the CBAS have been developed, with some versions (Millard, 1996; Smith, Zane, Smoll, & Coppel, 1983; Smith, & Smoll, 1990; Pappas, 2004) using additional categories such as humor or uncodable and some versions not even using all categories from the original version (e.g., general communication and keeping control). According to Conroy and Coatsworth, “little is known
about the psychometric properties of scores from this measure and single-item measures tend to have limited reliability” (2007b, p. 675). This suggests some items within the CBAS were found to have lower reliabilities while other items have higher reliabilities. Furthermore, reliability scores of the CBAS (test-retest, internal consistency) vary between studies (Barnes, 2003; Conroy & Coatsworth, 2007b; Smith, Smoll, & Hunt, 1977), suggesting that CBAS scores are influenced by irrelevant context and sample characteristics, suggesting that results of the CBAS should be interpreted cautiously.

The Coaching Feedback Questionnaire (CFQ) (Horn & Glenn, 1988) (Appendix 17; 21), which is a reliable and valid scale (Nicaise, Cogerino, Bois, & Amorose, 2006) contains sixteen items, representing different feedback patterns all of which are measured twice. Following desired behaviors the three response patterns are a) praise/reinforcement, b) non-reinforcement, c) reinforcement plus technical instruction which is a category not present in the CBAS. The five response patterns following unsuccessful outcomes/behaviors are d) mistake-contingent encouragement, e) ignoring mistakes, f) corrective instruction, g) punishment and h) corrective instruction plus punishment. For the statistical analysis, it was decided to count the two categories, corrective instruction and corrective instruction plus punishment together, leading to 4 items for this category. The items (Appendix 21) have to be indicated on a 5-point scale (very typical to not typical at all) in order to assess how typical the particular behaviors were displayed by the teams’ coach during games and training sessions. Alpha coefficients for individual subscales of this questionnaire have ranged from .62 to .91 (Horn & Glenn, 1988)

Based on the complex study design suggested, and although the CFQ seems to be more reliable, both the CBAS and the CFQ will be used while keeping the reliability scores in mind when interpreting the results.

1.4 Tools to assess sport participation motivation

The sport motivation scale (SMS) (Pelletier et al., 1995) (Appendix 19; 20) “is probably the scale most widely used to measure the various regulatory styles proposed by self-determination theory in the context of sport” (Pelletier & Sarrazin, 2007). The sport motivation scale (SMS) is a questionnaire with 28 items which assesses external regulation, introjected regulation, and identified regulation, which are all extrinsic motivational concepts that differ on their degree of perceived autonomy and self-determination (Deci & Ryan, 1985a, 2000). Additionally, it assesses amotivation and three types of intrinsic motivation (to
1 Introduction

know, to accomplish, and to experience stimulation). French and English versions of the questionnaire were validated in studies with Canadian athletes from different individual and team sports (Pelletier & Sarrazin, 2007). The results revealed “satisfactory internal consistency, a seven-factor structure that corresponds to the forms of motivation targeted by the scale, adequate construct validity, and moderate-to-high indices of temporal stability” (Pelletier & Sarrazin, 2007, p. 144). A simplex pattern which implies that scales which are theoretically closer have a higher correlation was proven in a meta-analysis of twenty-one studies (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003; Li & Harmer, 1996). Furthermore, an adequate test-retest reliability of .58 to .84 of the seven items was found by the developers of the questionnaire (Pelletier, Fortier, Vallerand, Tuson, & Briere, 1995).

However, the sport motivation scale (SMS) in its current form, distinguishing three different intrinsic motivation scales (to know, to experience stimulation, to accomplish, has been criticized for not incorporating integrated motivation (Mallett & Hanrahan, 2004), a lack of factorial validity (Martens & Webber, 2002; Riemer, Fink, & Fitzgerald, 2002), and low reliability/unacceptable internal consistency (Raedeke & Smith, 2001; Martin & Cutler, 2002; Vlachopoulos, Karageorghis, & Terry, 2000). Still Pelletier, Vallerand and Sarrazin (2007) have outlined that the structure, the reliability and the construct validity of the SMS has been proven for several populations from team-sports as well as individual sports. (Pelletier, Vallerand, & Sarrazin, 2007, p.617)

Here I put forward the hypothesis that the observed and perceived coaching behaviors by the coaches have a powerful impact on their athletes’ motivation mainly through the facilitation of the basic needs for competence and relatedness. Based on the reviewed literature, coaches using more punitive and non-reinforcing behaviors are expected to have athletes with less intrinsic and self-determined motivation than coaches who act in a more encouraging and reinforcing way. Additionally, I expect that coaches from teams which play in lower leagues will be found to have less influence on their players’ motivation, as the need for competence might be of less importance in leagues’ with a lower playing level.

The primary purpose of the study was to determine if observed coaching behaviors are related to athletes’ self-reported motivation. Several sources suggest that it is the perception of coaching behaviors by the athletes rather than the actually displayed and observed coaching behaviors which have an effect on motivation (Ommundsen & Bar-Eli, 1999; Allen & Howe, 1998; Amorose & Horn, 2000; Amorose & Smith, 2003; Amorose & Weiss, 1998; Black & Weiss, 1992). A secondary purpose was to determine the extent to which the coaching
behaviors which were categorized and observed match with the athletes’ perception of the coaching behaviors.

Additionally, and acknowledging the importance of perceptions, the relation between perceived coaching behaviors and athletes’ self-reported motivation will be assessed as this link might be of highest importance in determining athletes’ motivation. Additional comparisons will be made between the quantity of measured behaviors between these two to assess if significant differences exist between the observed coaching behaviors during games and training sessions. The primary goal of this work is to analyze the influence of different coaching behaviors on different types of motivation of handball players. For this purpose the coaching behaviors will be differentiated between observed and perceived coaching behaviors which both will be put separately in relation to the different types of motivation. The secondary goal is to analyze which factors (different coaching behaviors and assumed confounding factors) might have an influence on the types of motivation and the extent of the interplay of these different factors.
2 Methods

2.1 Overview of study designs

Acknowledging the fact that the sport motivation scale is probably the most frequently used scale to assess contextual sports motivation on the grounds of self-determination theory and the numerously existing studies confirming the construct validity and reliability of the SMS (Jackson, Kimiecik, Ford, & Marsh, 1998; Hamer, Karageorghis & Vlachopulos, 2002; Ntoumanis, 2001; Sarrazin, Vallerand, Guillet, Pelletier, & Curry, 2001; Chantal, Guay, & Dobreva Martinova, 1996; Alexandris, Tsorbatzoudis, & Grouios, 2002; Doganis, 2000; Georgiadis, Biddle, & Chatzisarantis, 2001) in different cultural backgrounds, it was decided to use the SMS as the measurement instrument of motivation in the design of this study as it may give valuable insights into the different motivational constructs effected by coaching behaviors.

Although different other coaching assessment systems like the leadership scale for sports (LSS) (Chelladurai & Saleh, 1978), the coaching behavior recording form (Darst, Zakrjaskek, & Mancini, 1989) or the Arizona State University Observation Instrument (ASUOI) (Lacy & Darst, 1989) do exist, the author decided to restrict the instruments to the three discussed before as these were found to be especially useful in assessing motivation and coaching behaviors using the theoretical framework of self-determination theory.

Different ways of gathering data were used. An observational design was chosen to categorize the displayed coaching behaviors during one training session and one game. The athletes’ motivation was measured by a questionnaire (SMS) assessing why the athletes are active in their sport. Perceived coaching behaviors were assessed through the Coaching Feedback Questionnaire. The research performed for this study was correlational in nature and no intervention was initiated.

2.2 Participants

The participant sample was composed of handball players actively involved in competitive structures characterized by regular games and training sessions. A total of seventeen teams and their male coaches were observed, leading to 177 players (mean 10.41 players per team) in total who filled out the questionnaires. All teams were male teams and consequently the study was conducted exclusively with male participants. Participating players had a mean age of 25.09 years (SD 8.83). The playing experience of the players was 15.83 years (SD 8.18)
2 Methods

(i.e., passed years since issuing the first playing license and therefore being eligible to play) (Appendix 8 and 9). One condition of including teams was their scheduled training days. In order to achieve a good comparability it was decided only to include teams which train on Mondays or Fridays in order to have a time span between the games at the weekend and the training sessions observed of either one or two days after or one or two days before a game.

The sample size calculation was made with some presuppositions. The slope coefficient between observed coaching behaviors and perceived coaching behaviors was estimated to be approximately 0.4 %. The highest difference of one observed coaching behavior in relation to another coach was expected to be 20 %. The variance on the 5-point Likert scale was expected to be approximately 1. Values on the Likert scale of more than 5 or less than 1 were counted as 5 or 1 accordingly. The probability of having a type 1 error was set at 5 %. Taking these assumptions for granted, the sample size calculation revealed that eighteen teams were necessary to achieve a statistical power of over 80 %.

It was decided to include teams from different playing leagues in order to achieve a cross-sectional design with different playing levels. For practical reasons it was decided to only include teams from the Lower Rhine region in order to be able to have distances that allow more than one observation per day. For male handball, there are ten different playing leagues in that region. As the focus of the study is on coaching behaviors and their effects it was decided to exclude professional and semi-professional handball, which eliminates the first, the second, and the third league as the author hypothesizes that financial incentives influence players’ motivation in a way that cannot be controlled for adequately in this study. The tenth league was excluded as one inclusion criteria was that all teams had regular training sessions and an identifiable coach, and this condition was not given for this lowest league. Additionally, four youth teams (A-Juniors) were included, who are at the age of 17 to 18 years in order to also include young adult participants. Younger participants were excluded because the instruments used were only validated for an adult population.

In order to minimize the possible influence of the observed teams’ placement in their leagues’ tables, it was attempted to have at least two teams from each league, with one being from the bottom half of each leagues’ respective table and one team being from the upper half of this league. However, as the set time frame for observations was nine weeks, all observations had to fit into this time frame, and training observations necessarily took place before the game observations some leagues had more participating teams because their games and training sessions fit better into this time frame.
2 Methods

Eventually, two teams from the fourth league (Oberliga), one team from the fifth league (Verbandsliga), two teams from the sixth league (Landesliga), five teams from the seventh league (Bezirksliga), three teams from the eighth league (Kreisliga), one team from the ninth league (1. Kreisklasse) and four youth teams participated. However, one team from the seventh league, whose game observation took place before the training session observation cancelled its training session, and as this was the last week of their season and no training took place afterwards within the set time frame, this team had to be excluded from the study (as the questionnaires were given out during training sessions and this was not possible anymore with this team). Additionally, for one team of the lowest observed league (ninth league – 1. Kreisklasse) the coaching behavior could not be observed as the coach was only present during games. The observers were not told this before this training session; however, the questionnaires were given out and collected. In this case only the coaching behavior during the game was put into relation with the self-reported motivation of the athletes. Two of the four observed youth teams were observed during their qualification round which is a preliminary round in which, based on the results and places available in the different playing leagues, the participating teams are grouped into the different leagues according to their results during that tournament. Consequently, for these two teams it could not be determined before these games which league they were belonging to as this was only decided afterwards on grounds of these results.

Due to these aforementioned recruitment conditions, it was not possible to achieve an equal distribution of teams within each league. Additionally, it was necessary to include some teams (n=4) which either trained on Tuesdays or Thursdays. This was regarded as undesirable, but unproblematic as having one day less or more before a game was not considered to have a significant impact on the coaching behavior and else it would not have been possible to include this number (n=17) of teams within the aforementioned time frame. Therefore it was decided to change the inclusion criteria slightly rather than to drop a high number of participating teams which would not have fit these criteria exactly.

Recruitment of participants began with finding out which teams of the relevant leagues had their training sessions on the aforementioned days and additionally had their games on the weekend at compatible times, so that as many teams as possible could be observed each weekend. After finding out their contact numbers, the coaches of the teams which fit these criteria were contacted by telephone. After being told the rationale and the procedure of the study, the coaches were asked for consent and an agreement was made for
the date of the first observation. Although the coaches were told that their verbal and non-verbal feedback to players’ actions were recorded and categorized, they were not being told what categories and what method of categorizing and recording would be used. This was done because it was expected that there would be less reactivity in coaches’ behavior if the coaches did not know exactly what the observers were looking for. Of all teams contacted (n=19) only one team refused allowance without being willing to give reasons.

2.3 Recording procedure

As an observational method the coaching behavior assessment system (Smith et al., 1977) was used in a slightly modified version as proposed by Pappas (2004). Two of the twelve categories suggested by Smith et al. (1977) were dropped as it was found that they were problematic in being distinguished from the other categories. These two categories were general communication and keeping control.

For the present study it was decided to use the ten category version as this would fit best to typical handball coaching behaviors. It was decided to have two observers who are familiar with and licensed in handball coaching in order to be able to interpret specific handball terms into the appropriate categories. Additionally, it was found desirable to have two different recordings for every game and training session in order to achieve an inter-rater reliability that may help to evaluate in how far the different categories are distinguishable and the extent to which both observers differ in interpreting the same behaviors.

The observations were always carried out by the same two observers, one of who being the author of this work and the other one being a licensed coach of childrens’ handball. Both observers were trained by the Training Manual for the Coaching Behavior Assessment System as this manual was “designed as part of an instructional program for training researchers in the use of the Coaching Behavior Assessment System (CBAS)” (Smith et al., 1977, p. 1). This training included fitting different example coaching behaviors into categories and discussing the results as well as comparing them to the solutions as proposed in the training manual.

Every team was informed by their coaches about the rationale of the study and the recording procedure immediately before the training session. The coaches also informed their teams that the observations would take place at this particular training session and at the game on the weekend of the same week. In most cases, the two observers were also given the chance to introduce themselves shortly and give information about the method of the study.
2 Methods

2.3.1 Recording procedure and categorization

All training sessions took place in the evenings in the sports halls of the chosen teams. Both observers were visually present for all players during the whole of all training sessions. Recording of the coaches’ behavior began with all players assembling on the court and the coaches’ initial speech about organizational issues (such as today’s training focus, mistakes from the last games etc.). If the coaches decided to introduce the two observers and inform the players about the rationale of the study, this behavior was not counted and recorded as the author considered this behavior to be irrelevant to the actual coaching process. The recording ended when the coach verbally ended the training session; if a final meeting of players on the court initiated by the coach took place immediately before leaving the sports hall, these tactical or organizational issues were still counted as being part of the training session and therefore they were recorded. Importantly, it was made clear beforehand who the “first” coach was if more than one coach was present, as only his behavior was counted. However, there was never really a problem to differentiate the coach from his assistant whose behaviors were not counted.

For all training sessions the two observers placed themselves at a position where they could observe and understand the coaches’ feedback in an unobtrusive manner while still being able to hear statements given in a calm way. For this reason, the two observers frequently had to change location when the coach chose new positions for his feedback. The two observers positioned themselves in such a distance from each other that neither of them could see the notes of the other observer, however, close enough for being able to ask the other observer what the coach said, if the words were hard to understand.

It turned out that with this method nearly all of the feedback the coach was giving to the players could be easily understood. In the few cases in which behaviors were not clearly understood by both observers they “compared” their respective understanding. If then there was still no certainty about what had been said, the observers guessed what might have been said based on the non-verbal behavior and the action which preceded the feedback.

After one pilot observation which was carried out for training purposes and which was not included into the study results both observers discussed the potential issues of the categorization system. Especially the categorizations of “non-reinforcement” and “ignoring mistakes” were found to be controversial.

As reinforcement or non-reinforcement are defined as reactive behaviors (to a players’ successful performance in the case of reinforcement and to a players’ unsuccessful
2 Methods

performance in the case of non-reinforcement) the definitions of successful and unsuccessful performances had to be made clear. Strictly speaking, every caught pass is a successful performance. Accordingly, every ball that is not passed “properly” or not caught immediately is a mistake. Therefore, every time when the coach does not comment on such a “successful” or “unsuccessful” action it needs to be counted. However, it was decided only to include significant “actions” like a missed fast-break, a missed penalty shot, and repetitive mistakes like not catching the ball or failing to give a pass. Both observers agreed on what these significant actions were and tried to be consistent in the counting of these actions and the according feedback of the coach.

2.3.2 Distinction between different behaviors and categories

Every coaching behavior was counted with a dash in the check-list. Every coaching category which was displayed was counted separately. One single utterance or sentence could therefore include more than one category and consequently was counted accordingly. A statement like “That was a good pass, but you have to keep your arm extended while shooting” could therefore be counted as reinforcement and mistake-contingent technical instruction. Non-verbal feedback was counted according to the category it was assigned to.

Additionally, a separation between behaviors was made when the same behavior took longer than ten seconds. As long as the same behavioral performance took ten seconds or less, even if more than one sentence was devoted to the same behavior, it was counted as one dash in the check list. As soon as the same category was displayed for longer than ten seconds, the behavior was counted again every ten seconds. This separation and “re-counting” was especially useful for the two categories of organization and general technical instruction as these could sometimes last longer than the ten seconds chosen to delimit one unit.

This ten-seconds separation of the same behavior was also suggested by other authors (Pappas, 2004; Cushion, 2001). However, as with the different categories used in different studies, the intervals in separating the different behaviors of the same category have not been consistent. Cushion (2001) for example suggested intervals of five seconds. For this study, after the pilot observation, it was decided to use ten seconds as the appropriate interval.

Every training session lasted approximately 90 minutes. The game observations started with the beginning of the games as indicated by the initial whistle by the referees. No tactical or organizational commands were recorded before that time. However, the two observers also recorded the coaches’ instructions during half-time in the cabin where they also placed themselves in a visible but unobtrusive manner. As a handball game quite frequently
2 Methods

has time-outs during which the coaching behaviors were still recorded and a break of ten minutes, the recorded time in total, until the final whistle of the match which was the end of the recording, was also approximately 90 minutes.

2.3.3 Measurement of self-reported motivation and perceived coaching behavior

Immediately following the training session, the players were given a questionnaire which consisted of two parts. The first part was the Coaching Feedback Questionnaire (CFQ) (Horn & Glenn, 1988) which is the questionnaire form assessing the perceptions of athletes’ based on the coaching categories of the CBAS (Smith et al., 1977) as described in the literature section. Indices of coaching behaviors were calculated in order to aggregate the compositional score of the two items which are supposed to measure the same coaching category. Additionally, the sport motivation scale (SMS) (Pelletier, et al., 1995), which is also discussed in the section on research about coaching effectiveness, was included into the questionnaires given out. The coaching feedback questionnaire includes 16 items assessing 8 different types of motivation such as: “That was a really stupid play!”. The sport motivation scale includes 28 items with 4 items testing each of the 7 different types of motivation.

All participants were asked to fill out the questionnaires immediately after the training session in order to assure high return rates of the questionnaires. Only players who actively participated in the training sessions were allowed to fill out a questionnaire. Players who were injured or just watched the training session as a spectator were not asked to fill out the questionnaire as it was hypothesized that only those who participated actively and over the whole training session were influenced by the coaching behavior in the way which was tried to be assessed by the study instruments.

Also players who attended and participated in the training session as guests or who were not nominated for the game at the weekend were asked to fill out the questionnaire based on their perceptions and experiences they had made with the particular coach so far. Questionnaires were only given out after the one observed training session and all (n=177) but one questionnaire were returned immediately after being given out and being filled out on the same day. The one person who did not return the questionnaire “just felt not like filling out a questionnaire”.

The questionnaires also included a column which asked the participants to indicate their age and their years of playing experience (since the first issuing of their playing license). Approximately half of the teams (n=9) had an additional question in their questionnaire which asked whether they felt that their coach was structuring and leading the training session as
2 Methods

usual in spite of the observation. Only nine of the teams had questionnaires with this additional question because the idea of having this reactivity “measurement” only came up half way during the study when one participant told the observers that the coach was unusually friendly during that training session.

All questionnaires were collected after the training session and gathered in a separate folder for every team.

2.4 Translation procedure of the questionnaires

As all three instruments, the sport motivation scale (SMS) (Pelletier, et al., 1995), the CBAS (Smith et al. 1977) and the Coaching Feedback Questionnaire (CFQ) (Horn & Glenn, 1988) were developed and validated in their English version, in order to use the instruments in a German field setting they had to be translated into German. The translation procedure was done by two bilingual speakers, as proposed by Sobhonslidsuk (2004), who both are native speakers of German and have a high proficiency in English as one is of half American descent and the other one being in possession of an academic degree in the English language. All items of both the CFQ and the SMS as well as all categories of the CBAS and all additional information such as introductory words on the questionnaires were independently translated by both translators from English into German. Then the results of both translations were compared and the few differences were discussed. As only few differences existed, both translators easily reached agreement on the few divergent items and no third refereeing translator had to be contacted.

2.5 Statistical Analysis

To analyze if there are significant differences between the observed coaching behaviors during training sessions and the observed coaching behaviors during games, a paired independent t-test will be conducted. The interobserver reliability of the two observers’ categorization of the observed coaching behavior was performed separately for training sessions and the game situations for all of the 10 coaching behaviors.

The reliability of the items of the Sports Motivation Scale questionnaire was calculated using Cronbach’s alpha for every scale. The observed coaching behaviors which were put in relation to (1) the different types of motivation and (2) the coaching behaviors as perceived by the players, were always taken as the mean of the two observers. The observed and the perceived coaching behaviors cannot be matched on a one-to-one basis. The
2 Methods

equivalences can be found in Appendix 8. This means that not all observed coaching behaviors can be matched with a perceived coaching behavior. The observed coaching behaviors were taken as the mean of the training and the game observation. Values of the different types of motivation and the perceived coaching behaviors were both assessed on the individual level. (n=160-177)

All results lie on an interval and therefore the Pearson correlation coefficient was used to test whether significant differences between observed coaching behaviors and perceived coaching behaviors as assessed by the Coaching Feedback Questionnaire existed.

The mean values of the observed coaching behaviors were put in relation to the different types of motivation as assessed by the Sports Motivation Scale. The Pearson correlation coefficient was again used to check for significant relationships as well as for the potential relationships between perceived coaching behaviors and the different types of motivation. For all analyses, the different kinds of motivation were taken as scales using the aggregated score of the four items assessing the seven different types of motivation.

Hierarchical regressions were conducted to analyze the potential impact of different variables taken together on the handball players’ motivation. The different types of motivation were taken as the dependent variable and all of the seven types of motivation as assessed through the SMS (Appendix 20) were checked separately for the observed coaching behaviors and the hypothesised confounding variables. The second type of regression models was calculated taking the seven types of motivation (Appendix 20) again as the dependent variable in relation to the perceived coaching behaviors and the hypothesised confounding variables.

The characteristics of each team such as participating players per team, playing league, juniors/seniors, result of the observed game (lost, draw, won), result of the last game (lost, draw, won), and placement in the leagues’ table (upper half or bottom half) can be found in Appendix 1. The games result will be a dichotomous variable as the game result will be differentiated between “won” or “not won”, meaning that the one case of a draw will be counted as “not won”. The placement in the table will also be dichotomous as the differentiation will be between “upper half of the table” and “bottom half of the table”.

All of these characteristics together with the players’ age and playing experience were checked as potential confounders in the hierarchical regression analysis.
3 Results

In total, 177 participants filled out the questionnaire (mean 10.41 players per team). Participating players had a mean age of 25.09 years (SD 8.83) (Appendix 8). The playing experience of the players had a mean of 15.83 years (SD 8.18) (Appendix 9).

The inter-reliability of the ten observational categories (Appendix 22) for the game observation showed very strong correlations (>0.8) in six categories (Appendix 10). Two additional items had a strong correlation (>0.7), which could still be considered satisfactory for an observational instrument.

Only the two items non-reinforcement and organization showed coefficients between 0.6 and 0.7 which were not considered satisfactory, indicating that there is quite a big difference between the two observers in recording this item. Consequently, all results which are put in relation to these items in the following have to be judged cautiously.

For the training observations (Appendix 11), nine of the ten observational categories showed very strong correlations (>0.8) between both observers, with eight of these nine categories even having correlations of higher than (>0.9). However, similar to the game observation results, the category non-reinforcement showed no satisfying reliability between both observers with a correlation of only (>0.5). Therefore, it has to be outlined again that all results which are in correlation with the item non-reinforcement must be considered as having a low reliability. The item organization, however, had a different reliability in game situations (>0.7) compared to training sessions. (<0.9)

3.1 Differences in coaching behavior between games and training sessions

Of the ten pairs analyzed only three proved to be significantly different (Appendix 12 and 13 for descriptive statistics and t-tests).

<table>
<thead>
<tr>
<th>Paired T-Test</th>
<th>Paired differences</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>T</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Reinforcement (Game) – Non-Reinforcement (Training)</td>
<td></td>
<td>2.5</td>
<td>1.87</td>
<td>5.35</td>
<td>15</td>
<td>.000</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction (Game) – Mistake-contingent technical instruction (Training)</td>
<td></td>
<td>-11.0</td>
<td>17.2</td>
<td>-2.56</td>
<td>15</td>
<td>.02</td>
</tr>
<tr>
<td>Organization (Game) - Organization (Training)</td>
<td></td>
<td>-30.16</td>
<td>29.48</td>
<td>-4.09</td>
<td>15</td>
<td>.001</td>
</tr>
</tbody>
</table>

Table 1: Significant correlational differences between observed coaching behaviors (CBAS) recorded during training sessions and games
3 Results

The coaching behavior \textit{non-reinforcement} was displayed significantly more often in game situations than in training sessions ($p=.000$, $T=5.35$, df:15). \textit{Mistake-contingent technical instruction} was significantly more often displayed in training sessions ($p=.02$, $T=2.56$, df:15). \textit{Organization} was displayed nearly twice as often in training sessions ($p=.001$, $T=4.09$, df:15). \textit{Punishment} misses significance with a $p$-value of .07. All other pairs of coaching behavior differences between games and training sessions are clearly not significant.

3.2 Reliability of Sports Motivation Scale items

The SMS scales had acceptable reliability; Cronbachs’ alphas were between .64 (amotivation) and .78 (intrinsic motivation – to know). The other scales had Cronbachs’ alpha values of .73 (intrinsic motivation – to accomplish), .68 (intrinsic motivation – to experience stimulation), .69 (extrinsic motivation – identified), .72 (extrinsic motivation – introjected) and .70 (extrinsic motivation – external regulation).

3.3 Correlations among Sports motivation scales (SMS)

<table>
<thead>
<tr>
<th></th>
<th>Intrinsic motivation – to know</th>
<th>Intrinsic motivation – to accomplish</th>
<th>Intrinsic motivation – to experience stimulation</th>
<th>Extrinsic motivation – identified</th>
<th>Extrinsic motivation – introjected</th>
<th>Extrinsic motivation – external regulation</th>
<th>Amotivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic motivation</td>
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<td>.60**</td>
<td>.54**</td>
<td>.23**</td>
<td>.38**</td>
<td>.27**</td>
<td>-.11</td>
</tr>
<tr>
<td>– to know</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Intrinsic motivation</td>
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<tr>
<td>– to accomplish</td>
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<tr>
<td>Intrinsic motivation</td>
<td>-</td>
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<tr>
<td>– to experience</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stimulation</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>.43**</td>
<td>.54**</td>
<td>.32**</td>
<td>-.21**</td>
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</tr>
<tr>
<td>– identified</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrinsic motivation</td>
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<td></td>
<td>.30**</td>
<td>.44**</td>
<td>-.10</td>
<td></td>
</tr>
<tr>
<td>– introjected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrinsic motivation</td>
<td>-</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>– external regulation</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Amotivation</td>
<td>-</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

* Correlation significant on a 0.05 (2-tailed) level.
** Correlation significant on a 0.01 (2-tailed) level.

Table 2: Correlations among Sports Motivation Scales (SMS)
3 Results

The results confirmed the simplex pattern (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003; Li & Harmer, 1996) of the SMS. As the different types of motivation are assumed to lie on a continuum, categories further away from each other must have a lower correlation whereas categories nearer each other must have a higher correlation. This pattern can be found in the present sample, however, the motivation type Extrinsc motivation - introjected is the exception as only one of its correlations fits this pattern. All correlations were significant with the exception of amotivation which was insignificant in four correlations.

3.4 Relationships between perceived coaching behaviors and observed coaching behaviors

<table>
<thead>
<tr>
<th>Observed coaching behavior – Perceived coaching behavior</th>
<th>Correlation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement</td>
<td>.20**</td>
<td>176</td>
</tr>
<tr>
<td>Non-reinforcement</td>
<td>-.08</td>
<td>176</td>
</tr>
<tr>
<td>Mistake-contingent encouragement</td>
<td>.20**</td>
<td>176</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction</td>
<td>.03</td>
<td>176</td>
</tr>
<tr>
<td>Punishment</td>
<td>.31**</td>
<td>176</td>
</tr>
<tr>
<td>Punitive technical instruction</td>
<td>.09</td>
<td>175</td>
</tr>
<tr>
<td>Ignoring mistakes</td>
<td>.02</td>
<td>176</td>
</tr>
</tbody>
</table>

Table 3: Significant correlations between observed coaching behaviors and perceived coaching behaviors

For positive reinforcement a positive correlation was present between this observed coaching category and the perceptions of the players for this category. \( r = .20, r^2 = 4\%, p=.008 \)

Mistake-contingent encouragement showed a positive correlation \( r = .20, r^2 = 4\%, p=.007 \) between the observations and the perceptions of this coaching category. Punishment had a positive correlation between the observations and the perceptions for this coaching category. \( r = .31, r^2 = 9.4\%, p=0.00 \) All other correlations were non-significant.

3.5 Relationships between observed coaching behaviors and different types of motivation

Of the 70 possible correlations six are significant. Non-reinforcement positively correlated with Intrinsic motivation - to know \( r = .19, r^2 = 3.0\%, p=.01 \), Intrinsic motivation - to accomplish \( r = .16, r^2 = 2.6\%, p=.04 \), Extrinsic motivation - external regulation \( r = .16, r^2 = 2.6\%, p=.03 \). Positive reinforcement negatively correlated with Extrinsic motivation: Introjected \( r = -.16, r^2 = 2.6\%, p=.03 \) and Extrinsic motivation - External regulation \( r = -
3 Results

.19, r² = 3.0%, p=.01). Ignoring mistakes positively correlated with Amotivation (r = .15, r² = 2.3%, p=.04).

<table>
<thead>
<tr>
<th>Positive reinforcement</th>
<th>Intrinsic motivation - to know</th>
<th>Intrinsic motivation - to accomplish</th>
<th>Intrinsic motivation - to experience stimulation</th>
<th>Extrinsic motivation - identified</th>
<th>Extrinsic motivation - introjected</th>
<th>Extrinsic motivation - external regulation</th>
<th>Amotivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement</td>
<td>-.07</td>
<td>-.04</td>
<td>-.12</td>
<td>-.07</td>
<td>-.16†</td>
<td>-.19†</td>
<td>-.15</td>
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<tr>
<td>Non-reinforcement</td>
<td>.19*</td>
<td>.16†</td>
<td>.13</td>
<td>.05</td>
<td>.09</td>
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<td>-.03</td>
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<td>.05</td>
<td>-.05</td>
<td>-.07</td>
<td>-.04</td>
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<td>.06</td>
<td>-.07</td>
<td>-.11</td>
<td>-.05</td>
<td>-.07</td>
<td>-.04</td>
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<td>Punishment</td>
<td>.06</td>
<td>.04</td>
<td>.06</td>
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<td>-.00</td>
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<td>.03</td>
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<td>.09</td>
<td>-.03</td>
<td>.15†</td>
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<tr>
<td>General technical instruction</td>
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*. Significant on a 0.05 (2-tailed) level.

Table 4: Correlations between observed coaching behaviors and different types of motivation

3.6 Relationships between perceived coaching behaviors and different types of motivation

Positive reinforcement correlated positively with Intrinsic motivation - to accomplish (r = .15, r² = 2.3%, p=.05) and Intrinsic motivation - to experience stimulation (r = .20, r² = 4.9%, p=.01). Ignoring mistakes negatively correlated with Intrinsic motivation - to accomplish (r= -.17, r² = 2.9%, p=.035). Amotivation positively correlated with 4 different coaching behaviors. Non-reinforcement (r = .23, r² = 5.2%, p=.001), punishment (r = .16, r² = 2.5%,
3 Results

$p=.04$, punitive technical instructions ($r = .26, r^2 = 6.6\%, p=.001$) and ignoring mistakes ($r = .16, r^2 = 2.6\%, p=.04$). All other correlations were insignificant.

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<th></th>
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<th>Intrinsic motivation - to accomplish</th>
<th>Intrinsic motivation - to experience stimulation</th>
<th>Extrinsic motivation - identified</th>
<th>Extrinsic motivation - introjected</th>
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Table 5: Correlations between perceived coaching behaviors and different types of motivation

3.7 Regression analysis

3.7.1 Regression analyses of observed coaching behaviors, potential confounding variables and different types of motivation

The explained variance of the regression model ($p=.008$) of Intrinsic motivation – to know is 6.9%, leaving over 90% to influences of variables outside the model. Playing experience ($\beta = -.19, p=.02$) is one of the two significant variables in the model indicating that the higher the playing experience, the lower this type of motivation in the participants. Punishment ($\beta = .25, p=.03$) is the second significant variable in this model. A higher presence of this category lead to a higher value in Intrinsic motivation - to know.

The explained variance of the regression model ($p=.04$) of Intrinsic motivation – to accomplish is 4.2%. The influence of the placement in the table ($\beta = .42, p=.01$) indicates that
3 Results

if a team is placed in the upper half of their table, this kind of behavior is significantly more often displayed by the coaches. More positive reinforcement ($\beta = -.32, p=.03$) leads to less motivation of this kind. General encouragement ($\beta = .27, p=.05$) leads to more *Intrinsic motivation - to accomplish*, the more often it is displayed. More frequently displayed coaching behavior of Organization ($\beta = -.21, p=.01$) lowers this kind of motivation.

The regression model of *Intrinsic motivation - to experience stimulation* is non-significant whereas the explained variance of the regression model ($p=.002$) of *Extrinsic motivation -

<table>
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<tr>
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<th>Intrinsic motivation – to experience stimulation</th>
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| $R^2$                | 6.9%**                         | 4.2%*                              | 0.9%                                          | 9.7%**                         | 2.7%*                              | 2.1%*                                    | 2.4%*       |

* Significant on a 0.05 (2-tailed) level.
3 Results

** Significant on a 0.01 (2-tailed) level.

**Table 6**: Regression analyses of the ten observed coaching behaviors, the six potential confounding variables and the seven different types of motivation identified is 9.7%. Playing experience in years ($\beta = .24, p=.002$) has an increasing influence on this kind of motivation indicating that the higher the experience, the lower this kind of motivation. The last games’ result ($\beta = -.33, p=.02$) indicates that if the last game was won this Extrinsic motivation - identified was lower than for those players who did not win. The coaching behavior, Mistake-contingent encouragement, ($\beta = -.88, p=.003$) lead to a significantly lower motivation of this type, the more often it was displayed which was also the case for Punitive technical instruction ($\beta = -.35, p=.03$) and Organization ($\beta = -.36, p=.001$). General technical instruction ($\beta = .43, p=.02$) lead, the more often it was displayed to more Extrinsic motivation - identified.

The explained variance of the model ($p=.04$) of Extrinsic motivation – external regulation is 2.1%. The only variable left in the model is the observed coaching behavior, Positive reinforcement ($\beta = -.17, p=.04$), which lead to higher Extrinsic motivation - external regulation, the more often it was displayed.

The explained variance of the regression model ($p=.03$) of Amotivation is 2.4%. The only significant variable left in the model is the observed coaching behavior, Ignoring mistakes ($\beta = .17, p=.03$), which means that the more the coach ignores mistakes the more amotivated the players are.

3.7.2 Regression analyses of perceived coaching behaviors, potential confounding variables and different types of motivation

The explained variance of the regression model ($p=.004$) of Intrinsic motivation – to know is 5.5%. The only significant variable, Playing experience in years, ($\beta = .23, p=.004$) indicates that the higher the playing experience, the lower this kind of motivation.

The explained variance of the regression model ($p=.02$) of Intrinsic motivation – to accomplish is 3.5%. The only significant influence of any variable is the influence of the perceived coaching behavior: Ignoring mistakes ($\beta = -.17, p=.04$) which indicates that the higher this kind of behavior the lower Intrinsic motivation - to accomplish.

The explained variance of the regression model ($p=.01$) of Intrinsic motivation – to experience stimulation is 4.1%. The perceived coaching behavior, positive reinforcement, ($\beta = -.18, p=.03$) leads, the more often it is displayed, to more Intrinsic motivation - to experience stimulation and is the only variable with a significant influence.
3 Results

The explained variance of the regression model (p=.002) of Extrinsic motivation - identified is 8.0%. Players’ age in years (β = .26, p=.001) had an increasing influence for this kind of motivation, the higher the age of the players the lower this kind of motivation. If the observed game (β = .23, p=.05) was won, Extrinsic motivation - identified was higher. The more Non-reinforcement (β = -.16, p=.04) was displayed by the coach, the lower was this kind of motivation. The explained variance of the model (p=.01) of Extrinsic motivation – introjected is 4.2%. If the last game (β = -.18, p=.02) was won this kind of motivation was lower. The regression model of Extrinsic motivation – external regulation was non-significant. The explained variance of the model (p=.001) of Amotivation is 9.9%. Punitive technical instruction (β = .23, p=.003) and Ignoring mistakes (β = .15, p=.05) lead the more

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<td>R²</td>
<td>5.5%**</td>
<td>3.5%*</td>
<td>4.1%*</td>
<td>8.0%**</td>
<td>4.2%*</td>
<td>3.4%</td>
<td>9.9%**</td>
</tr>
</tbody>
</table>

* Significant on a 0.05 (2-tailed) level.
** Significant on a 0.01 (2-tailed) level.

Table 7: Regression analyses of the seven perceived coaching behaviors, the six potential confounding variables and seven different types of motivation.
3 Results

often they were displayed by the coaches to more amotivation in the players. The last games‘
result ($\beta = -.16$, $p=.04$) had the statistically significant influence, that if the last game was
won, Amotivation was lower in the players.
4 Discussion

4.1 Findings of the study and limitations of the CBAS results

Altogether, the results based on the study designs and samples used do not support the hypotheses which were formulated before the study was carried out. The main hypothesis that the different observed coaching behaviors have a strong influence on different motivational concepts of handball players could not be verified on the basis of the obtained results.

Of the seventy possible correlations of the ten coaching behaviors with the seven motivational categories only six were significant. Three of these significant correlations were related to the item *non-reinforcement* which was found to be not reliable in the test-retest procedure. Therefore, analyzing these results seems to be not useful as the validity and reliability of the results obtained cannot be trusted and have to be seen very critical. However, the findings that a higher amount of displayed *non-reinforcement* by the coach leads to more *intrinsic motivation - to accomplish* and more *intrinsic motivation - to know* is contradictory to findings stating that it is in fact *reinforcement* which increases players’ intrinsic motivation (Vallerand, 1983; Deci, Koestner, & Ryan, 1999; Cameron & Pierce, 1994).

In line with cognitive evaluation theory (Deci & Ryan, 1980), this may be because of the increased perceived competence which derives from reinforcement following desired outcomes. However, this relationship could not be proven based on the findings in this study. Therefore it is especially surprising based on the tenets of self-determination theory that positive reinforcement decreased *Extrinsic motivation - Introjected* and *Extrinsic motivation - External regulation*, but it does not increase intrinsic motivation. Ignoring mistakes positively correlated with Amotivation indicating that a player which is not given feedback after mistakes may feel less competent and also the need for relatedness may be decreased leading to lower self-determination.

The relationship of the eight perceived coaching categories and the seven types of motivation showed seven significant correlations which do all support the tenets of self-determination theory. Positive reinforcement increased *Intrinsic motivation - to accomplish* and *Intrinsic motivation - to experience stimulation* which may be because of the increased perceived competence. Ignoring mistakes may have lead to a lower competence leading to a decreased *Intrinsic motivation - to accomplish*. Ignorance of undesired behaviors may also contradict the universal need for relatedness as the athlete may feel neglected and also may wish to have clear instructional feedback on how to perform better next time to increase his
4 Discussion

This decrease of competence may also very well be the reason for increase in amotivation following the four different negatively oriented coaching behaviors: Non-reinforcement, punishment, punitive technical instructions and ignoring mistakes. It has to be outlined that the explained variance of all significant relationships is small.

Before conducting this correlation study different potential confounding factors have been considered. As the influence of the observed coaching behaviors and the perceived coaching behaviors were found to be marginal for most correlations it might be especially interesting to look at other factors that might have an influence on the players’ motivation, as these may represent parts of the large unexplained variance which has an influence on motivation. However, the separate regression analyses for all seven motivational categories as proposed by self-determination theory also showed not one single model with an explained variance of more than 10%. The model with the highest explained variance (9.9%) was the amotivation model in relation to the potential confounding variables and the perceived coaching behaviors. All three significant variables may have had an influence on amotivation through the basic need of perceived competence which may be increased through Punitive technical instruction and Ignoring mistakes and decreased through the positive feedback on competence after winning the last game.

The explained variance of the regression model of the observed coaching behaviors, the potential confounding variables and Extrinsic motivation - identified was 9.7%. Playing experience in years may have an increasing influence on this kind of motivation as with a higher age and a higher experience it is less the destiny for achievements which leads the athletes but rather the conviction of its usefulness. The last games’ result may at the same time decrease a wish to win the next game if the last one was already won. This finding goes in line with achievement goal theory (Nicholls, 1984, 1989) which differentiates between judging competence in a more self-referenced manner where the self-improvement is in the center of interest (task-involvement) or putting emphasis on a normative fashion (such as the playing result in the study) which is concerned with ego-involvement. Ego-involved people were found to be driven less by intrinsic kinds of motivation but more driven by extrinsic kinds of motivation, which supports the results obtained in this study (Dweck, 1986; Nicholls, 1984, 1989; Balaguer, Duda, Atienza, & Mayo, 2002). The position of the coach has also been outlined as an important influence on whether individuals have more task-involvement or ego-involvement in the context of sport (Ames, 1992b; Nicholls, 1989).
4 Discussion

Of the impact of the three coaching behaviors, Mistake-contingent encouragement, Punitive technical instruction and Organization, only the impact of punitive technical instruction goes in line with the tenets of self-determination theory as it may again decrease perceived competence leading to non-identified values and goals. The fact that general technical instruction the more often it was displayed, lead to more Extrinsic motivation - identified may be attributed to the players’ need to get valuable instructions to increase their competence and to feel related through this kind of feedback. The influence of the perceived coaching behaviors and the potential confounders on Extrinsic motivation - identified explained 8% of the variance in this regression model. In this model it was again the case that higher players’ age lead to a higher kind of identification with extrinsic motivation. The influence of a win in the observed game may lead to more identification through the perception of competence, whereas the frequent display of Non-reinforcement may again decrease this feeling of competence. It has to be outlined that the explained variance of all regression models is lower than 10% leaving over 90% unexplained in every model.

An additional finding is that the observed coaching behaviors and the coaching behaviors as perceived by the players correlated significantly in only three of the seven possible correlations with consequently four coaching behavior categories where the perceptions of the players and the observations of the coaching behaviors did not correlate significantly indicating quite a big difference in observations and perceptions. It is especially noteworthy that the most significant correlation was related to punishment, with the other category, mistake-contingent technical instruction, also focusing on an undesired behavior which means that the focus is on an undesired negative behavior in two of the three cases. This finding indicates that negative feedback may be especially present in the perception of players. At the same time, this finding also suggests a possible presence of reactivity in the coaching behaviors during observations (Landsberger, 1958). However, this can only be partially confirmed. The questionnaires administered to the last eight teams included the additional question if the players were of the opinion that their coach was behaving and giving feedback in the same way as usual. This idea came up when a few players stated that their coach behaved more friendly during the observation. Yet of the ninety-six players who answered this question only nine (9.4%) players stated that their coach behaved unusual which indicates a rather low, however present reactivity.

The three differences in coaching behaviors between games and training sessions all seem to make sense as for example the coach in the case of the already controversially
4 Discussion

discussed non-reinforcement category might feel that potential desired behaviors need to be reinforced more in training sessions where the voice and feedback of the coach is more present than in game situations. Additionally, he might feel that the result is already a reinforcement or non-reinforcement during games and additional reinforcement might not be needed to the extent present in training sessions. The category organization is much more present in training situations, in fact nearly twice as often, which can be easily explained with the coaches’ most important duties of organizing training sessions. Giving tactical and technical instructions is assumed to be of higher importance in games (Cassidy, Jones, & Potrac, 2009).

*Mistake-contingent technical instruction* was significantly more often displayed during training sessions which also makes sense as technical instruction is a coaching behavior which is typically done on an individual basis during training sessions were the coach can take his time to focus more on behaviors which improve players’ techniques or performances in the long term. In comparison, coaching behaviors during games typically focus on achieving a good result in the particular game by giving technical and tactical instructions which directly should have an influence on the teams’ performance on the team level (Martens, 2004).

The findings (Vangucci, Potrac, & Jones, 1997; Lacy & Darst, 1989; Sherman & Hassan, 1986) that a higher expertise in top-level coaches leads to more specific feedback, such as technical and tactical feedback, whereas coaches of lower leagues and qualification tend to be more general in their feedback (Wandzilak, Ansorge, & Potter, 1988) including a higher amount of punishment related behaviors (Conroy, & Coatsworth, 2007a) could also not be verified based on the results of the study as no significant differences in coaching were detected across leagues.

The reliability of the Sports Motivation Scale (SMS) for the present sample was acceptable for all items supporting the validity and reliability reported in other studies. (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003; Li & Harmer, 1996) It has to be stated that the inter-rater reliability of the CBAS (Smith, Smoll, & Hunt, 1977) was found to be high in eight of the ten categories. These results support the high test-retest reliability found by other authors (Smith, Smoll, & Hunt, 1977; Barnes, 2003) as the independent application and comparison of two different observers which was the case in this study can be regarded as a test-retest procedure. The coaching behavior organization was only found to be not reliable during game situations. The reason for this might be that although the observers always had a
4 Discussion

very practical placement during the games to listen to the coaches’ behaviors and statements, the acoustics in games are much more disturbing when trying to filter out the organizational statements by the coaches than in the training situations where only the team is present. Additionally, organizational coaching behaviors during games seem to be more on an individual level as the coaches know about the acoustic problems, i.e. that not all players may be able to hear them. When, for example, a coach tells a player on which position he has to play, this is done on a calm acoustic level with which the game specific noises stated before interfere. In contrast to this, the organizational statements of the coach during training sessions in general are more on a team level, addressing big parts of the team as they typically contain explanations of exercises and drills. These differences between game and training situations may lead to the very high agreement between the two observers for the category organization during training sessions and the much lower agreement during games (Appendix 10 and 11).

However, the category non-reinforcement as stated in the literature review was found to be especially hard to distinguish in the filed setting of team handball. As non-reinforcement is defined as the answer to a desired behavior, the ultimate question which arises is: What is a “desired behavior” in handball? The two observers decided to include only significant positive actions, like scoring a goal, saving a penalty or giving a crucial pass which leads to a good chance for the own team. However, it has to be admitted that following this procedure, “desired behavior” is not clearly defined which may have lead to low reliability of the category non-reinforcement in both training and game situations.

4.2 General limitations of the study

As the correlations between coaching behaviors and different motivational concepts which were obtained are fewer and those few which were found are much weaker than expected the question evolves what may have lead to these rather unexpected results.

A possible explanation could be found in the data gathering procedure of this work. The correlation study cannot give any prove for causality of the influence of certain coaching behaviors. Taking the Hierarchical Model of Intrinsic and Extrinsic Motivation (Vallerand, 1997) as the basis, it has to be made clear that the different instruments do not all measure the same levels of motivation. The Coaching Behavior Assessment System (CBAS) (Smith, Smoll, & Hunt, 1977) measures different coaching behaviors in a particular situation, in the case of the study in one training session and one game, whereas the Coaching Feedback
4 Discussion

Questionnaire (CFQ) (Horn & Glenn, 1988) tries to assess the coaching behaviors as they are perceived by the players on a contextual level. The CFQ focuses on the question how typical certain coaching behaviors are for their coach, which means in general and in more than this particular training session. The sport motivation scale (Pelletier et al., 1995) also measures motivation on a contextual rather than on a situational level. So two of the analyzed variables are located on the contextual level of handball (SMS + CFQ) whereas the observational variable (CBAS) is located on the situational level, which might have had an influence on the results. Although top-down effects from the contextual level to the situational level have been reported (Vallerand, 2007), “situational factors concern transient variables encountered in a specific activity, at a specific time, that may not remain constant” (Vallerand, 2007, p. 263) this is a crucial finding as this points to the difference between the more stable contextual factors and the less constant situational factors, i.e. the coaching behavior in one particular training session or game.

Additionally, the assessment of motivation through the SMS can only point to the motivation stated by the players at one particular point in time. Further research might address this issue by assessing a development of motivation and its relation to different coaching behaviors displayed over a longer period of time. This was not possible in the present study as this study was rather describing the status quo of motivation in relation to different coaching behaviors and no baseline results were present. It might very well be the case that for example reinforcing coaching behaviors increased the intrinsic motivation of a particular team with a lower baseline intrinsic motivation although this increase could not be detected by the present design as this design just compared the obtained values in relation to the other teams. Therefore, to assess whether such effects exist for one particular team repeated measure designs are necessary.

The study also implicitly assumes that the different coaching behaviors with their influence on motivation are a question of quantity, however what might be of bigger impact is the quality of the feedback given by the coach (Muraven, Gagné, & Rosman, 2008) and its perception by the players. Additionally, the study solely focuses on the influence of the coach and therefore neglects possible influences of family, friends, referees or other team members which might also have an influence on the motivation of each individual player. So of all ten possible sources of competence information as proposed by Horn, Glenn, and Wentzell (1993) the coach is only one. However, a second social factor source which was tested in the study was the result of the game.
The Coaching Behavior Assessment System (CBAS) (Smith, Smoll, & Hunt, 1977) measures verbal and non-verbal feedback given by the coach. Although the Coaching Feedback Questionnaire (CFQ) developed on the basis of the CBAS was created as a questionnaire form, it focuses on verbal feedback (Appendix 22). The only two non-verbal categories which are tested in the CFQ are related to ignoring desired or undesired behaviors by the athletes. Body language is not assessed in the CFQ, however, it is measured by the CBAS when, for example, the coach shakes his head. These differences between the two measurement instruments may have also lead to differences in the assessment.

Additionally, the recorded coaching behaviors by the CBAS are recorded on a general level which means that they were directed to the team as a whole. No differentiation was made on whether one player was addressed directly or not. In contrast to this procedure the CFQ can be interpreted as if the behaviors had been directed at the player who fills out the questionnaire (e.g. “Great play! Now you’re keeping your eyes on the ball”). This difference in the CBAS assessment procedure and the CFQ assessment procedure may explain the different results for players of the same coach in the perceptions of his coaching behavior.

Based on the quantitative assessment of the observations, a dose-response of autonomy support is assumed as more reinforcement and may, for example, lead to higher perceived competence by the athletes. However, this solely quantitative approach of assessing coaching behaviors neglects the individual context of each coaching behavior displayed. Consistent reinforcements given for an activity that is already perceived as intrinsically motivating may lead to an overjustification effect (Lepper, Greene, & Nisbett, 1973; Enzle & Ross, 1978; Deci, Koestner, & Ryan, 1999) and so reinforcing behaviors by a coach have to be considered context-specific, which cannot be done in a simple quantitative observational assessment. Further research therefore should try to assess the individual context in which certain coaching behaviors are displayed in order to gain a more profound insight into their influence.

The study design also assesses the influence of the coaching behaviors solely with regard to their effect on motivation. Therefore, based on the study design no conclusions can be drawn as to whether these coaching behaviors are effective for skill learning or performance improvement.

Any kind of motivation, be it extrinsic or intrinsic, be it more autonomous or less autonomous cannot be considered as being of higher value per se. Individual predispositions towards achievement as being characterized in the achievement goal framework of Elliot and
4 Discussion

McGregor (2001), which differentiates between mastery-approach and avoidance goals as well as performance-approach and avoidance goals, and also in the Regulatory Focus Theory (Higgins, 1997), which differentiates between promotion and prevention focus, may be of high importance in the case of extrinsic motivation. Further research might rather focus on the question if the individual achievement motivation direction (avoidance or performance focus) is in line with the individual predispositions which might even have a stronger positive impact than more self-determined motivation which is not in line with the individuals’ achievement focus.

Besides quantifying the coaching behaviors, the additional knowledge of “athletes’ chronic regulatory orientation is of importance for the selection of athletes, the adjustment of tactics and strategies, and coaches’ framing of instructions” (Plessner, Unkelbach, Memmert, Baltes, & Kolb, 2009, p. 108).

4.3 Further research recommendations

Further research which may aim at giving practical coaching recommendations may need to assess the individual regulatory orientation of the players. Addressing the weaknesses and limitations of the correlation design of this study, further research should also address the aforementioned regulatory achievement orientations. This may be conducted in experimental designs to assess whether these hypothesized relationships between motivation and individual predispositions can be manipulated by different coaching behaviors. Research assessing the long-term effects of the influence of coaching behaviors on motivation may also assess the question whether the positive consequences of intrinsic or more self-determined motivation, which have been mentioned by other authors for samples different than handball, may also be present in handball specific samples like the one used in this study and whether the results obtained can also be generalized to female handball players and other sport contexts.

The present study is conducted from two different perspectives, i.e. an observers’ view on the coaching behaviors, and the players’ view on the coaching behaviors and on their own motivation. It would be interesting to have the coaches’ view on both, i.e. his perceptions of his own coaching behavior and of his athletes’ motivation, as this would give further insight on possible differences in perceptions of external observers, players and the coach. Additionally, the coaching experience of the coach and the years of responsibility for the tested teams would be of interest in this context.
4 Discussion

The design of the present study analyses the coach-established climate as an antecedent of the athletes’ motivation and thereby completely neglects the possibility that coaching and the motivational climate may be an interactive process where athletes’ motivation might have an influence on the coaching behaviors as well as the coaching behaviors on the athletes’ motivation (Sarrazin, Boiche, & Pelletier, 2007).

Even in repeated measurement designs, the quantity of measurements typically does not exceed more than two measurements (in the case of the study, the measurements have been restricted to two, one training and one game situation). However, to assess typical coaching behaviors over a longer period of time or to assess development in motivation, it may be necessary to rely on measurement procedures which do not make a presence of the observers or raters necessary. One such method which has been proposed is the use of diary studies (Gagné & Blanchard, 2007) which requires athletes to recall what they felt during a number of training sessions and “average” these feelings over a period of time (e.g. in the past month)” (Gagné & Blanchard, 2007, p. 249).

Based on the obtained results no recommendation for coaching behaviors of handball can be given, as the expected relations of encouraging and reinforcing behaviors and motivation could not be proven in the present sample. The present study may give a valuable insight into the relationships between observed coaching behaviors, perceived coaching behaviors and motivation for a particular sample of handball players on the grounds of self-determination theory. Based on the hypotheses made before the study and the review of literature, the results have to be described as rather surprising as nearly all assumed correlations were not present and those significant correlations which were present were only of marginal effects for this specific sample. However, these results should not be interpreted as a denial of the coaches’ influence on athletes’ motivation. Whether and in how far the results of the chosen sample can be generalized for handball players of all playing levels, possibly also including professional handball should be analyzed in further research. More sophisticated study designs than the present correlation design which do not only examine a specific point in time will have to be developed to understand the very complex interplay through which coaches influence their athletes’ motivation.


Intrinsic Motivation and Self-Determination in Exercise and Sport (pp. 209-227). Champaign, IL: Human Kinetics.


Motivation and Self-Determination in Exercise and Sport (pp. 243-254). Champaign, IL: Human Kinetics.


Table of Appendices

Appendix 1: Participating teams’ characteristics ................................................................. 55
Appendix 2: Mean values – Game observations (Observer 1+2) ........................................ 56
Appendix 3: Mean values – Training observations (Observer 1+2) ................................. 56
Appendix 4: Mean, Median, Standard deviation of coaching behavior observed
during games (Observer 1+2) .............................................................................................. 57
Appendix 5: Mean, Median, Standard deviation of coaching behavior observed
during training sessions (Observer 1+2) ............................................................................ 57
Appendix 6: Motivation scales as assessed by the Sports motivation Scale (SMS)
questionnaire (Total of all participants) .............................................................................. 57
APPENDICES A:

<table>
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<tr>
<th>Team</th>
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<th>Seniors (S)</th>
<th>Observed Game:</th>
<th>Last Game:</th>
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Appendix 1: Participating teams’ characteristics

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Appendix 2: Mean values – Game observations (Observer 1+2)

Appendix 3: Mean values – Training observations (Observer 1+2)
### Appendix 4: Mean, Median, Standard deviation of coaching behavior observed during games (Observer 1+2)

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<th>Standard-deviation</th>
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<td>20.0</td>
<td>7.34</td>
<td>17</td>
</tr>
<tr>
<td>Punishment (Observer 1+2)</td>
<td>12.21</td>
<td>11.0</td>
<td>8.23</td>
<td>17</td>
</tr>
<tr>
<td>Punitive technical instruction (Observer 1+2)</td>
<td>4.41</td>
<td>4.5</td>
<td>2.93</td>
<td>17</td>
</tr>
<tr>
<td>Ignoring mistakes (Observer 1+2)</td>
<td>.85</td>
<td>.0</td>
<td>1.62</td>
<td>17</td>
</tr>
<tr>
<td>General technical instruction (Observer 1+2)</td>
<td>59.5</td>
<td>56.0</td>
<td>24.66</td>
<td>17</td>
</tr>
<tr>
<td>General encouragement (Observer 1+2)</td>
<td>35.26</td>
<td>27.5</td>
<td>28.72</td>
<td>17</td>
</tr>
<tr>
<td>Organization (Observer 1+2)</td>
<td>33.62</td>
<td>32.5</td>
<td>12.8</td>
<td>17</td>
</tr>
</tbody>
</table>

### Appendix 5: Mean, Median, Standard deviation of coaching behavior observed during training sessions (Observer 1+2)

<table>
<thead>
<tr>
<th>Behavior Assessment System (CBAS)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard-deviation</th>
<th>Valid N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement (Observer 1+2)</td>
<td>36.06</td>
<td>33.25</td>
<td>19.31</td>
<td>16</td>
</tr>
<tr>
<td>Non-reinforcement (Observer 1+2)</td>
<td>.47</td>
<td>.0</td>
<td>.76</td>
<td>16</td>
</tr>
<tr>
<td>Mistake-contingent encouragement</td>
<td>5.59</td>
<td>4.75</td>
<td>4.67</td>
<td>16</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction (Observer 1+2)</td>
<td>29.34</td>
<td>33.75</td>
<td>16.46</td>
<td>16</td>
</tr>
<tr>
<td>Punishment (Observer 1+2)</td>
<td>8.94</td>
<td>8.0</td>
<td>6.42</td>
<td>16</td>
</tr>
<tr>
<td>Punitive technical instruction (Observer 1+2)</td>
<td>3.47</td>
<td>1.75</td>
<td>5.59</td>
<td>16</td>
</tr>
<tr>
<td>Ignoring mistakes (Observer 1+2)</td>
<td>.97</td>
<td>.5</td>
<td>1.36</td>
<td>16</td>
</tr>
<tr>
<td>General technical instruction (Observer 1+2)</td>
<td>43.03</td>
<td>39.75</td>
<td>23.0</td>
<td>16</td>
</tr>
<tr>
<td>General encouragement (Observer 1+2)</td>
<td>37.38</td>
<td>32.0</td>
<td>27.46</td>
<td>16</td>
</tr>
<tr>
<td>Organization (Observer 1+2)</td>
<td>63.81</td>
<td>56.5</td>
<td>27.06</td>
<td>16</td>
</tr>
</tbody>
</table>

### Appendix 6: Motivation scales as assessed by the Sports motivation Scale (SMS) questionnaire (Total of all participants)

<table>
<thead>
<tr>
<th>Item in the Coaching Feedback Questionnaire (CFQ)</th>
<th>Corresponding Item in the Coaching Behavior Assessment System (CBAS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Good play!&quot;</td>
<td>Positive reinforcement</td>
</tr>
<tr>
<td>The coach ignores your good performance.</td>
<td>Non-reinforcement</td>
</tr>
</tbody>
</table>
"Way to go! You really extended your elbow that time."
Positive reinforcement

"Great play. Now you’re keeping your eyes on the ball."
Positive reinforcement

"Excellent work in practice today."
Positive reinforcement

Coach doesn’t say anything to you about your good performance.
Non-reinforcement

"That’s O.K. Keep working at it!"
Mistake-contingent encouragement

Coach ignores your error or good performance.
Ignoring mistakes

"That was a really stupid play!"
Punishment

"You dropped your elbow. Next time keep it up."
Mistake-contingent technical instruction

"How many times have I told you to extend your elbow?"
Punitive technical instruction

"Hang in there! You will do better next time."
Mistake-contingent encouragement

Coach doesn’t say anything to you about your error or poor performance.
Ignoring mistakes

"Your technique looks lousy! Keep your head up."
Punitive technical instruction

"That play sucked!"
Punishment

"No, that’s not right. You need to work on a faster release."
Mistake-contingent technical instruction

Appendix 7: Correspondence between CFQ Items and CBAS Items

<table>
<thead>
<tr>
<th>Participating players’ age (in years)</th>
<th>Participants’ playing experience (in years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
</tr>
<tr>
<td>Mean</td>
<td>25.09</td>
</tr>
<tr>
<td>Median</td>
<td>22.0</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>8.83</td>
</tr>
</tbody>
</table>

Appendix 8: Participants’ age

Appendix 9: Participants’ playing experience

Correlation – Games (Observer 1+2)

<table>
<thead>
<tr>
<th>Observed Category</th>
<th>Pearson Correlation</th>
<th>Significance (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement</td>
<td>.99**</td>
<td>&lt; .001</td>
<td>17</td>
</tr>
<tr>
<td>Non-reinforcement</td>
<td>.62**</td>
<td>&lt; .001</td>
<td>17</td>
</tr>
<tr>
<td>Mistake-contingent encouragement</td>
<td>.85**</td>
<td>&lt; .001</td>
<td>17</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction</td>
<td>.79**</td>
<td>&lt; .001</td>
<td>17</td>
</tr>
</tbody>
</table>
### Correlation for each item observed through the CBAS between both observers for the games

**Significance (2-tailed) < .001**

- **N** = 17

<table>
<thead>
<tr>
<th>Observed category</th>
<th>Pearson Correlation</th>
<th>Significance (2-tailed)</th>
<th><strong>N</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement</td>
<td>.96**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Non-reinforcement</td>
<td>.47</td>
<td>.066</td>
<td>16</td>
</tr>
<tr>
<td>Mistake-contingent encouragement</td>
<td>.81**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction</td>
<td>.96**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Punishment</td>
<td>.92**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Punitive technical instruction</td>
<td>.98**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Ignoring mistakes</td>
<td>.95**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>General technical instruction</td>
<td>.95**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
</tbody>
</table>

*Correlation significant on a 0.05 (2-tailed) level.

**Correlation – Training sessions (Observer 1+2)**

<table>
<thead>
<tr>
<th>Observed category</th>
<th>Pearson Correlation</th>
<th>Significance (2-tailed)</th>
<th><strong>N</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement</td>
<td>.96**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Non-reinforcement</td>
<td>.47</td>
<td>.066</td>
<td>16</td>
</tr>
<tr>
<td>Mistake-contingent encouragement</td>
<td>.81**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction</td>
<td>.96**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Punishment</td>
<td>.92**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Punitive technical instruction</td>
<td>.98**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>Ignoring mistakes</td>
<td>.95**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
<tr>
<td>General technical instruction</td>
<td>.95**</td>
<td>&lt; .001</td>
<td>16</td>
</tr>
</tbody>
</table>
Appendix 4

Pair 1

Paired T-Test

<table>
<thead>
<tr>
<th>Pair</th>
<th>Paired differences</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive reinforcement (Game, Observer 1+2) – Positive reinforcement (Training, Observer 1+2)</td>
<td>2.31</td>
<td>19.48</td>
</tr>
<tr>
<td>Non-reinforcement (Game, Observer 1+2) – Non-reinforcement (Training, Observer 1+2)</td>
<td>2.5</td>
<td>1.87</td>
</tr>
<tr>
<td>Mistake-contingent encouragement (Game, Observer 1+2) – Mistake-contingent encouragement (Training, Observer 1+2)</td>
<td>-.06</td>
<td>6.04</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction (Game, Observer 1+2) – Mistake-contingent technical instruction (Training, Observer 1+2)</td>
<td>-.06</td>
<td>6.04</td>
</tr>
<tr>
<td>Punishment (Game, Observer 1+2) – Punishment (Training, Observer 1+2)</td>
<td>-11.0</td>
<td>17.2</td>
</tr>
<tr>
<td>Positive reinforcement (Game, Observer 1+2) – Positive reinforcement (Training, Observer 1+2)</td>
<td>2.31</td>
<td>19.48</td>
</tr>
<tr>
<td>Non-reinforcement (Game, Observer 1+2) – Non-reinforcement (Training, Observer 1+2)</td>
<td>2.5</td>
<td>1.87</td>
</tr>
<tr>
<td>Mistake-contingent encouragement (Game, Observer 1+2) – Mistake-contingent encouragement (Training, Observer 1+2)</td>
<td>-.06</td>
<td>6.04</td>
</tr>
<tr>
<td>Mistake-contingent technical instruction (Game, Observer 1+2) – Mistake-contingent technical instruction (Training, Observer 1+2)</td>
<td>-.06</td>
<td>6.04</td>
</tr>
<tr>
<td>Punishment (Game, Observer 1+2) – Punishment (Training, Observer 1+2)</td>
<td>-11.0</td>
<td>17.2</td>
</tr>
</tbody>
</table>
Pair Punitive technical instruction (Game, Observer 1+2) – Punitive technical instruction (Training, Observer 1+2) | .75 | 5.67 | .53 | 15 | .61
Pair Ignoring mistakes (Game, Observer 1+2) – Ignoring mistakes (Training, Observer 1+2) | -.06 | 2.07 | -.12 | 15 | .91
Pair General technical instruction (Game, Observer 1+2) – General technical instruction (Training, Observer 1+2) | 15.56 | 36.83 | 1.69 | 15 | .11
Pair General encouragement (Game, Observer 1+2) – General encouragement (Training, Observer 1+2) | -2.28 | 36.86 | -.25 | 15 | .81
Pair Organization (Game, Observer 1+2) - Organization (Training, Observer 1+2) | -30.16 | 29.48 | -4.09 | 15 | .001

Appendix I3: T-test analysis for differences of coaching behaviors between game and training situations

### APPENDIX B:

- **Social factors**
  - Global factors
  - Contextual factors
  - Situational factors

- **Mediators**
  - Global perceived self-determination
  - Global perceived competence
  - Global perceived relatedness
  - Contextual perceived self-determination
  - Contextual perceived competence
  - Contextual perceived relatedness
  - Situational perceived self-determination
  - Situational perceived competence
  - Situational perceived relatedness

- **Types of motivation**
  - Global motivation IM, EM, AM
  - Intrinsically motivated IM, AM
  - Externally motivated EM
  - Amotivated AM

- **Life contexts**
  - Education IM, EM, AM
  - Interpersonal relations IM, EM, AM
  - Leisure IM, EM, AM

- **Consequences**
  - Global affect
  - Global cognition
  - Global behaviour
  - Contextual affect
  - Contextual cognition
  - Contextual behaviour
  - Situational affect
  - Situational cognition
  - Situational behaviour

Appendix 14: A hierarchical model of intrinsic and extrinsic motivation in sport and exercise.
Vallerand, 2001
Appendix 15: Horn’s (2002) Model of Coaching Effectiveness

In T.S. Horn (Ed.), *Advances in sport psychology* (pp. 309-354). Champaign, IL: Human Kinetics.

Appendix 16: Smoll’s and Smith’s Cognitive-Mediational Model
Appendix C:

**Trainer Rückmeldungs-Fragebogen**

Wie Sie wahrscheinlich wissen, gibt es bei Trainern große Unterschiede in der Art ihrer Rückmeldung im Anschluss an die sportlichen Ausführungen. Dieser Fragebogen ist ausgelegt, den Typus der Rückmeldung Ihres Trainers während des Trainings oder während eines Spiels herauszufinden.

**ALTER**

**SPIEL-ERFAHRUNG HANDBALL (in Jahren):**

**Trainer Rückmeldungen auf erfolgreiche Aktionen**

Unten aufgeführt sind 6 Beispiele von Rückmeldungen, die Sie von Ihrem Trainer nach erfolgreichen Ausführungen im Training oder während des Spiels erhalten könnten.

**BITTE SCHÄTZEN SIE EIN, WIE TYPISCH FÜR IHREN TRAINER DIE JEWEILIGE AUSSAGE NACH ERFOLGREICHEN AKTIONEN IST.**

<table>
<thead>
<tr>
<th></th>
<th>In keiner Weise typisch</th>
<th>sehr typisch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>„Gut gespielt.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2</td>
<td>Der Trainer ignoriert ihre gute Ausführung</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3</td>
<td>Weiter so, Du hast deinen Ellbogen wirklich ausgestreckt</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4</td>
<td>„Super gespielt. Jetzt hältst du den Ball im Blick.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5</td>
<td>„Exzellente Arbeit im Training heute.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6</td>
<td>Der Trainer sagt Ihnen nichts zu ihrer guten Leistung.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

**Trainer Rückmeldungen auf Fehler des Spielers**

Unten aufgeführt sind 10 Beispiele von Rückmeldungen, die Sie von Ihrem Trainer nach Fehlern oder einer falschen Ausführung während des Trainings oder des Spiels bekommen könnten.

**BITTE SCHÄTZEN SIE EIN, WIE TYPISCH FÜR IHREN TRAINER DIE JEWEILIGE AUSSAGE NACH FEHLENN ODER FALSCHEN AUSFÜHRUNGEN IST.**

<table>
<thead>
<tr>
<th></th>
<th>In keiner Weise typisch</th>
<th>sehr typisch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>„In Ordnung, arbeite weiter daran.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2</td>
<td>Trainer ignoriert ihren Fehler oder Fehlleistung.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3</td>
<td>„Das war wirklich dummi gespielt!“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4</td>
<td>„Der Ellbogen war zu tief, Halte ihn nächstes Mal oben.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5</td>
<td>„Wie oft habe ich dir gesagt, Der Ellbogen gestreckt!“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6</td>
<td>Halte durch, nächstes Mal wasst du es besser machen.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7</td>
<td>Der Trainer sagt nichts zu ihrer schlechten Ausführung</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8</td>
<td>„Deine Technik sieht laussig aus. Halte den Kopf aufrecht.“</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9</td>
<td>„Das war beschissen gespielt!“</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
10. „Nein, so war das nicht richtig. Du musst schneller passen.”

Sind Sie der Meinung, dass Ihr Trainer sich bei der heutigen Trainingseinheit trotz der Beobachtung so verhalten hat wie immer? JA oder NEIN (bitte Antwort umkreisen)
Informierte Einwilligung:

Der Trainer ist vor Beginn der Observation der Trainingseinheit und des Spiels über den Inhalt und das Ziel der Studie aufgeklärt worden.
Die beiden Beobachter verpflichten sich, alle in Zusammenhang mit der Observation und der Auswertung der Fragebögen gemachten Erkenntnisse vertraulich zu behandeln und nur zum Zweck der Studie zu benutzen.
Die beiden Beobachter sichern zu, dass die Observation vom jeweiligen Trainer zu jeder Zeit ohne Angabe von Gründen gestoppt werden kann.

UNTERSCHRIFT TRAINER

UNTERSCHRIFT JULIAN BAUER
### MOTIVATIONS-SKALA SPORT

Warum treibst du deinen Sport?

Benutze die unten aufgeführte Skala, um anzugeben, inwieweit die nachfolgenden Punkte mit deinen Gründen Sport zu treiben, korrespondieren.

<table>
<thead>
<tr>
<th>Stimmt überhaupt nicht</th>
<th>Stimmt ein wenig</th>
<th>Stimmt eingerissen</th>
<th>Stimmt größersoll</th>
<th>Stimmt genau</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Warum treibst du deinen Sport?

1. Aus Freude, die ich empfinde wenn ich spannende Erfahrungen mache.
   1 2 3 4 5 6 7

   1 2 3 4 5 6 7

   1 2 3 4 5 6 7

4. Aus Freude neue (Trainings-) Techniken zu entdecken.
   1 2 3 4 5 6 7

5. Ich weiß nicht mehr, ich habe das Gefühl, dass ich dichten Sport nie erfolgreich betreiben werde.
   1 2 3 4 5 6 7

   1 2 3 4 5 6 7

   1 2 3 4 5 6 7

8. Weil es mir eine große persönliche Zufriedenheit gibt, bestimmte schwierige Techniken zu meistern.
   1 2 3 4 5 6 7

9. Weil es absolut notwendig ist Sport zu treiben, wenn man in Form bleiben möchte.
   1 2 3 4 5 6 7

10. Für das Ansehen ein Sportler zu sein.
    1 2 3 4 5 6 7

    1 2 3 4 5 6 7

12. Für die Erfüllung die ich spüre, wenn ich meine Schwachpunkte verbessere.
    1 2 3 4 5 6 7
13. Für die Aufregung, die ich empfinde, wenn ich wirklich an einer Aktivität beteiligt bin.
1  2  3  4  5  6  7

1  2  3  4  5  6  7

15. Für die Erfüllung die ich empfinde, wenn ich meine Fähigkeiten perfektioniere.
1  2  3  4  5  6  7

16. Weil Menschen um mich herum denken, dass es wichtig sei In Form zu sein.
1  2  3  4  5  6  7

17. Weil es ein guter Weg ist, um Dinge zu lernen, die mir auch in anderen Bereichen meines Lebens nützlich sein könnten.
1  2  3  4  5  6  7

1  2  3  4  5  6  7

1  2  3  4  5  6  7

20. Für das Vergnügen, dass es mir bereitet, gewisse schwierige Bewegungen durchzuführen.
1  2  3  4  5  6  7

1  2  3  4  5  6  7

22. Um Anderen zu zeigen, wie gut ich in meinem Sport bin.
1  2  3  4  5  6  7

23. Für die Zufriedenheit, die ich fühle, während ich neue (Trainings-) Techniken erlern, die ich noch nie vorher ausprobiert habe.
1  2  3  4  5  6  7

24. Weil es die beste Methode ist, meine freundschaftlichen Beziehungen zu pflegen.
1  2  3  4  5  6  7

1  2  3  4  5  6  7

1  2  3  4  5  6  7

27. Für das Vergnügen, neue Ausführungsstrategien zu entdecken.
1  2  3  4  5  6  7

1  2  3  4  5  6  7

Appendix 19: Questionnaire 1: Sports Motivation Scale (Translated, German Version)
THE SPORT MOTIVATION SCALE (SMS-28)
Luc G. Pelletier, Michelle Fortier, Robert J. Vallerand, Nathalie M. Brûlé, Kim M. Terzon and Marc R. Blais, 1995
Journal of Sport & Exercise Psychology, 17, 35-53

WHY DO YOU PRACTICE YOUR SPORT?

Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.

<table>
<thead>
<tr>
<th>Does not correspond at all</th>
<th>Corresponds a little</th>
<th>Corresponds moderately</th>
<th>Corresponds a lot</th>
<th>Corresponds exactly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

WHY DO YOU PRACTICE YOUR SPORT?

1. For the pleasure I feel in living exciting experiences.
2. For the pleasure it gives me to know more about the sport that I practice.
3. I used to have good reasons for doing sport, but now I am asking myself if I should continue doing it.
4. For the pleasure of discovering new training techniques.
5. I don't know anymore, I have the impression of being incapable of succeeding in this sport.
6. Because it allows me to be well regarded by people that I know.
7. Because, in my opinion, it is one of the best ways to meet people.
8. Because I feel a lot of personal satisfaction while mastering certain difficult training techniques.
9. Because it is absolutely necessary to do sports if one wants to be in shape.
10. For the prestige of being an athlete.
11. Because it is one of the best ways I have chosen to develop other aspects of myself.
12. For the pleasure I feel while improving some of my weak points.
13. For the excitement I feel when I am really involved in this activity.
14. Because I must do sports to feel good myself.
15. For the satisfaction I experience while I am perfecting my abilities. 1 2 3 4 5 6 7
16. Because people around me think it is important to be in shape. 1 2 3 4 5 6 7
17. Because it is a good way to learn lots of things which could be useful to me in other areas of my life. 1 2 3 4 5 6 7
18. For the intense emotions I feel doing a sport that I like. 1 2 3 4 5 6 7
19. It is not clear to me anymore, I don't really think my place is in sport. 1 2 3 4 5 6 7
20. For the pleasure that I feel while executing certain difficult movements. 1 2 3 4 5 6 7
21. Because I would feel bad if I was not taking time to do it. 1 2 3 4 5 6 7
22. To show others how good I am good at my sport. 1 2 3 4 5 6 7
23. For the pleasure that I feel while learning training techniques that I have never tried before. 1 2 3 4 5 6 7
24. Because it is one of the best ways to maintain good relationships with my friends. 1 2 3 4 5 6 7
25. Because I like the feeling of being totally immersed in the activity. 1 2 3 4 5 6 7
26. Because I must do sports regularly. 1 2 3 4 5 6 7
27. For the pleasure of discovering new performance strategies. 1 2 3 4 5 6 7
28. I often ask myself, I can't seem to achieve the goals that I set for myself. 1 2 3 4 5 6 7

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Kim M. Tuccori and Marc R. Blais, 1995

KEY FOR SMS-28

# 2, 4, 23, 27 Intrinsic motivation - to know
# 8, 12, 15, 20 Intrinsic motivation - to accomplish
# 1, 13, 18, 25 Intrinsic motivation - to experience stimulation
# 7, 11, 17, 24 Extrinsic motivation - identified
# 9, 14, 21, 26 Extrinsic motivation - introjected
# 6, 10, 16, 22 Extrinsic motivation - external regulation
# 3, 5, 19, 28 Amotivation
Appendix 20: Questionnaire 2: Sports Motivation Scale (English Version)


*Note:* To use this scale you require only to mention the complete reference data.

Thank you for your interest.

Good luck in your research.
Coaching Feedback Questionnaire
As you perhaps already know, coaches really differ from each other in the type of feedback they give in response to their athletes’ performances.
This questionnaire is designed to find out what type of coaching feedback your coach gives you in practices and games.

Coaching Reponses to Player’s Successes
Listed below are six examples of feedback your coach might give you after you have had a successful performance in a game or practice. PLEASE RATE EACH STATEMENT IN TERMS OF HOW TYPICAL YOUR COACH GIVES YOU THIS KIND OF FEEDBACK AFTER YOU HAVE HAD A SUCCESSFUL PERFORMANCE.

<table>
<thead>
<tr>
<th></th>
<th>Not Typical At All</th>
<th>Very Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “Good play!”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. The coach ignores your good performance.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. “Way to go! You really extended your elbow that time.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4. “Great play. Now you’re keeping you eyes on the ball.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5. “Excellent work in practice today.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>6. Coach doesn’t say anything to you about your good performance.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
**Coaching Responses to Player’s Errors**

Listed below are ten examples of feedback your coach might give you after you have had made a mistake or committed an error in a game or practice. PLEASE RATE EACH STATEMENT IN TERMS OF HOW TYPICAL YOUR COACH GIVES YOU THIS KIND OF FEEDBACK AFTER YOU HAVE HAD A PERFORMANCE ERROR OR POOR PLAY.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not Typical At All</th>
<th>Very Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “That’s O.K. Keep working at it!”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. Coach ignores your error or poor performance.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. “That was a really stupid play!”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4. “You dropped your elbow. Next time keep it up.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5. “How many times have I told you to extend your elbow?”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>6. “Hang in there! You will do better next time.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>7. Coach doesn’t say anything to you about your error or poor performance.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>8. “Your technique looks lousy! Keep you head up.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>9. “That play sucked!”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>10. “No, that’s not right. You need to work on a faster release.”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

Appendix 21: Questionnaire 3: Coaching Feedback Questionnaire (English Version)
Beobachtungsbogen

Datum:
Liga:
Beobachter:
Mannschaft:

Reaktive Verhaltensweisen des Trainers – Verbal und Non-Verbal:

Rückmeldungen auf gewünschte Ausführungen
1. Positive Bestärkung/Verstärkung:
2. Nicht-Bestärkung/Verstärkung:

Rückmeldungen auf Fehler/fehlerhaftes Verhalten:
3. Fehlerbedingte Aufmunterung/Ermunterung:
4. Fehlerbedingte technische Anweisungen:
5. Bestrafung:
6. Bestrafende technische Instruktionen:
7. Fehler-Ignorierung:

Spontane Verhaltensweisen des Trainers – Verbal und Non-Verbal:

8. Generelle technische Anweisungen:
9. Generelle Ermutigung/Aufmunterung:
10. Organisation:

Kommentare:

Appendix 22: German Version of the coaching behavior assessment system (CBAS) as used during the observations