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Pasi Syrjä

Performance-Related Emotions in  
Highly Skilled Soccer Players

A Longitudinal Study Based on the IZOF Model

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UNIVERSITY OF JYVÄSKYLÄ

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*To my children Emilia and Lotta*

*"We act as though comfort and luxury were the chief requirements of life, when all that we need to make us really happy is something to be enthusiastic about." Charles Kingsley*





## ABSTRACT

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Performance-related emotions in highly skilled soccer players: A longitudinal study based on the IZOF model

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Diss.

Previous emotion research in the sport setting has focused mainly on a single negative emotion, anxiety. Universal, similar-for-all, curves of several orientations, typically borrowed from other fields of science and in non-sport settings, have dominated this work. Researchers mostly have preferred a nomothetic approach using standardised emotion scales with researcher-generated content. Recently, more emphasis has been placed on examining a wider range of performance-related emotions, both positive and negative, using an idiographic, individual-oriented approach. The aim of the present study was to continue this process by examining emotional experiences related to successful and unsuccessful soccer performance. Theoretically, conceptually and methodologically the study is based on the assumptions of the IZOF (Individual Zones of Optimal Functioning) model proposed by Hanin (1993, 1995b, 1997a).

The participants were 68 players from two Finnish under-21 national soccer teams ranging from 17 and 23 years of age ( $M = 20.4$ ,  $SD = 1.1$ ). These players represent the most talented and highly skilled soccer players of two male "generations" in Finland selected by the head coach of the team. The first team was called together eleven and the second team ten times during the two-year period, and on each occasion the players were slightly different. Thus the study was carried out using a longitudinal approach with a constantly changing composition. Performance-related emotional experiences were studied using the individualised emotion profiling procedure (Hanin, 1997a; Hanin & Syrjä, 1995a).

The results indicated that the content of individually developed emotion scales was highly dissimilar between the players. It was also observed that the players used different adjectives in describing the emotions related to successful performance and to unsuccessful performance. Optimal and dysfunctional zones, indicating the level of intensity in successful and unsuccessful performances, were found to rank from low to high depending on the individual. Different zone levels were further observed in positive and negative emotions. At the intraindividual level, emotion profiles consisting of emotion descriptions and optimal and dysfunctional zones, were found to be highly variable when re-constructed by the players, although the emotion patterns at the inter-individual and group level remained rather similar. The task-related measurements before and after four international games showed that emotions varied greatly from pre-game through mid-game to post-game. The emotion-performance relationship was examined by testing the in-out of the zone hypotheses proposed within the IZOF model. The hypothesis pertaining to successful performance was supported in the measurements conducted just before and during task-execution, but the hypothesis concerning unsuccessful performance was not supported.

The study provides support for the IZOF assumption regarding content and intensity dimensions and extended the research into the dimension of time. Methodological considerations, future directions and practical implications are suggested.

Keywords: idiographic, longitudinal, IZOF model, emotion, affect, experience, soccer, performance and relationship

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Jyväskylä, December 1999

Pasi Syrjä



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## 1 INTRODUCTION

Sport without emotions would be sport without excitement, satisfaction, frustration, tension, or feelings of winning or losing – such sport would not be sport at all. As a matter of fact, emotions are an essential part of sporting activity. To perform well, the athlete needs specific emotions with specific intensities. The present investigation is focused on these emotional experiences.

The word emotion derives from the Latin “*emovere*”, which means to stir. Synonyms for the term stir are move, keep in motion, rouse, or e.g. incite (from New Webster Dictionary and Thesaurus). Emotions are something that get you moving make you do and act. It seems as if emotions are a basic energy battery for life. Emotions are studied here in highly skilled soccer players. Soccer is a contact team game that requires a lot of skill, physical strength and speed, knowledge and understanding about strategy and tactics, and the ability to cooperate with teammates. Soccer is also a long-duration sport, in which a match lasts about two hours. All these issues make special demands on what players experience when playing the game. Exploring the nature of the relationship between emotions and soccer performance is the central goal in the present study.

My personal interest in the topic has emerged from work in coaching and researching junior ice hockey and soccer players and teaching students. A desire to better understand and to gain information about the role of emotions in athletic performance and to derive implications applicable to practical work have been the primary motivators for the present investigation. The study continues the process of research on performance-related emotions that I commenced in 1993 with my master’s thesis. My special interest has focused on studying emotions in members of team sports, which, in fact, has received relatively less attention by researchers in past years (e.g. Krane, 1993; Raglin & Morris, 1994; Rodrigo, Lusiardo & Pereira, 1990).

Lazarus (1993) has pointed out a number of similarities in the literature with respect to emotions and the psychological stress process. In fact, the roots of the emotion research connected to highly demanding human performance can be traced back to period of World War II, when researchers took considerable interest in emotional breakdown in response to the “stresses” of combat (e.g. Gringer & Spiegel, 1945). These stress-related emotional experiences, which are mainly based on the consequences of threat, have dominated performance-related emotion research up to this day. In the field of sport psychology, for example, emotions have been studied very narrowly. In most cases, researchers have examined anxiety-based emotional experiences. In truth, the anxiety has been so predominant over the past three decades that, for instance, Kerr (1997, p. 104) has raised the question, “Why are researchers in sport psychology so preoccupied with this one particular emotion?” Thus, many researchers have addressed the need to extend the study to other performance-related emotions (Gill, 1994; Gould & Urdy, 1994; Gould & Tuffey, 1996; Hahn, 1989; Hanin, 1993, 1997a, b; Jones, 1995a; Kerr, 1997; Landers, 1994; Males & Kerr, 1996). Nevertheless, researchers have not succeeded in clarifying what emotions should be studied. It is still unclear what emotions most crucially influence athletic performance.

Several theoretical orientations, usually borrowed from other fields of science outside the sport setting, have been introduced to describe the relationship between emotions and athletic performance. However, most of these models and theories have been shown to be conceptually, methodologically and from the applied perspective inadequate to describe and explain such complicated and multidimensional phenomena as the emotion-performance relationship (Gould & Krane, 1992; Hanin, 1997a, b; Morgan & Ellickson, 1989; Raglin, 1992; Weinberg, 1990). One way to avoid these limitations is considered to be the use of a more idiographic, individual-oriented approach to cover a wider range of performance-related emotions, both positive and negative. This alternative is followed in Hanin’s (e.g. 1993, 1995b, 1997a, b) Individual Zones of Optimal Functioning (IZOF) model, which has been proposed as a conceptual framework for studying emotional experiences. The model is an extended version of the initial ZOF model applied to anxiety to take into account the wider spectrum of positive and negative emotions. Methodologically, the approach includes the individualised emotion profiling procedure, which enables emotions emphasising individual characteristics to be studied. Several studies have been conducted following the framework of the IZOF model with fairly consistent and supportive results (Bortoli, Robazza & Nougier, 1997; Hamill, 1996; Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b, 1997; Johnson, Anderson, AhYee & Makua, 1995; Rodazza, Bortoli & Nougier, 1998; Strand & Wedman, 1999; Syrjä, Hanin & Pesonen, 1995; Syrjä, Hanin & Tarvonen, 1995). Most of this work has examined emotional experiences from the perspective of content and intensity, while the temporal perspective has not been taken into consideration.

Therefore, the aim of the present real-life longitudinal study was to examine positive and negative emotional experiences in highly skilled players from two soccer teams following the conceptual, theoretical and methodological



assumptions of the IZOF model. A special purpose of the study was to replicate the earlier findings related to content and intensity of performance-related emotions and to extend the analysis by including a temporal perspective.

## **2 CONCEPTUAL, THEORETICAL AND EMPIRICAL BACKGROUND**

Since the period of World War II researchers have focused on exploring the relationship between “stressors”, arousal, or emotions and human performance by using various concepts, methods, and models both outside (see Lazarus, 1991, 1993, for a review) and within the sport setting (see, Gill, 1994; Gould & Krane, 1992; Hackfort & Schwenkmezger, 1993; Jones & Hardy, 1989; Wrisberg, 1994, for a review). In the sections that follow, the conceptual underpinnings of the earlier emotion studies will first be introduced. Then, the main concerns and limitations of the earlier research that has explored the emotion-performance relationship using the most popular existing theoretical orientations will be presented. Finally, the earlier emotion research in the competitive sport setting will be briefly reviewed.

### **2.1 Conceptual underpinnings**

In the section below, the term emotion will first be defined by relating the concept of emotion to the stress research suggestions as addressed by Lazarus (1993). Then, a classification of emotion-related terminology and emotion as a measurable variable will be introduced, and finally, the concepts used in the earlier studies on emotions in the sport setting will be reviewed.

#### **Emotion as a process: A stress research perspective**

The work defining the modern scientific concept of emotion has been reviewed in several recent publications (e.g. Fridja, 1986; Lazarus, 1991; Nummenmaa,

1998; Oatley & Jenkins, 1996). Lazarus (1993) has pointed out that this work has a number of similarities with that of defining the psychological stress process. According to Lazarus, although researchers have introduced many theories on the psychological stress process related to human performance both within and outside sport settings, there are always four concepts which are considered: 1) a causal external or internal agent, a stressor, which influences a person-environment relationship; 2) an evaluation by the mind or a physiological system that identifies what is a threat or is noxious for a person; 3) the coping processes used by the mind or body to deal with the demands of the person-environment relationship; and 4) a complex pattern of effects on mind and body. Lazarus suggests that these four concepts can be also taken into consideration in defining the concept of emotion.

Thus, with reference to these four concepts the term emotion will be defined as a process related to demanding human performance. The definition is mainly based on Lazarus's cognitive-motivational-relational theory of emotion (1991, 1993). It is worth pointing out that although the Lazarus's theory considers emotions, cognition, and motivation as a distinct constructs of the human mind, the theory also assumes that these three constructs strongly overlap (see Lazarus, 1991, p. 171-172). The theory of emotion also considers the relationship between the individual and the environment rather than either environmental or intrapersonal events alone. It is also emphasised that emotions are assumed to function between people to communicate intentions and set outline structures for interaction (Oatley & Jenkins, 1992). The concept of emotion introduced below is consistent with Frijda's (1986) argument that the emotions should be thought of as a process in four stages: appraisal; context evaluation; action readiness; and physiological change, expression and action. According to Lazarus, three issues - antecedent variables, mediating process and outcomes - need to be taken into account in understanding the process of emotions.

*Antecedent variables.* Emotions are proposed to have their origin in a reflection of the constantly changing relationship between person and environment (Lazarus, 1991). Emotion is a result of a person's conscious or unconscious appraisal of this person-environment relationship, depending on the particular environmental demands and personal characteristics that interact to produce the appraisal. According to Vygotsky (1926, 1984 cited in Hanin, 1989a, p. 19-20) the person-environment relationship contains at least three different possibilities: a) the predominance of the person over the environment, which results in relatively easy task execution; b) a person-environment balance; and c) the predominance of task demands compared to the person's ability and resources. Lazarus (1991, 1993) has further proposed that the triggers or agent for emotions can be either external or internal. According to Lazarus, external triggers consist of demands, resources, and constraints with which the person must deal, and formal conditions (imminence, uncertainty, and duration) that provide information about what is being faced. Internal triggers are a person's beliefs and motives about the self and the world that have remained central throughout the life course.

*Mediating process.* According to Lazarus's theory (1991, 1993) the mediating process can be differentiated into three classes: appraisal, action tendencies, and coping. Each of these will be briefly introduced.

Appraisal is based on how the individual evaluates or interprets a demand of the current person-environment relationship as a threat or as noxious for him or her. The process of appraisal divides into two different functions termed primary appraisal and secondary appraisal (Lazarus, 1982, 1984). Primary appraisal contains an assumption about whether what is happening is personally relevant. The process has three features: goal relevance, goal congruence or incongruence, and type of ego involvement (see Lazarus, 1991, p. 149-150). The concept of goal relevance indicates the motivational aspect that must be considered along with the emotions. This concept refers to the extent to which an encounter touches on personal goals. If there is no personal goal relevance, there is no emotion. The concept of goal congruence or incongruence reflects the extent to which a transaction is consistent or inconsistent with what the person wants. A consistent goal congruence leads to positive and an inconsistent goal congruence to negative emotions (this issue will be elaborated in later of this chapter). By the last concept, type of ego involvement, Lazarus refers to the perspectives of ego-identity or personal commitment that influences the mediating process. Secondary appraisal refers to coping options and prospects, and also includes three components: blame or credit, coping potential, and future expectations (see Lazarus, 1991, p. 150, for a definition). The secondary appraisal contains an assumption that emotions have a crucial significance not merely for how the individual thinks the events to come might affect him or her but also for how he or she might cope with those events. The process is based on an individual's conscious evaluation of the context. How to cope with a particular event and making plans are the sources of the typical thoughts possibly resulting in new emotions (see also Frijda & Swagerman, 1987).

Action tendencies or, as Frijda's (1986) proposes, action readiness indicates the link between an emotion and its physiological response patterns. Frijda (1986) has further argued that all emotions involve some change in a person's readiness to act. For instance, anger interrupts the current of action, generates the urge to do some of the things that will remove or harm its agent.

Coping processes, instead, indicate how a person deals with the person-environment relationship either in reality or in its appraised meaning with the purpose of changing the prior emotional state. Lazarus (e.g. 1991, 1993, 1996) has outline two types of coping processes termed: problem-focused coping and emotion-focused coping. Problem-focused coping process refers to an individual's action in dealing with an emotion. By doing something a person tries to change a current emotional state. Emotion-focused coping refers to the process by which a person thinks he or she will deal with an emotion. The process is centred on the change in the way in which the relationship is seen or interpreted by a person, resulting in the change in the meaning of the relationship. In other words, although the emotion has not disappeared, its meaning has changed.

*Outcomes.* The outcomes of the process of emotions have been classified as short- and long-term (Lazarus, 1991). Short-term results contain the immediate response components of emotion, which are actions, action tendencies, physiological changes, and subjective states (emotional experiences or affects). In other words, occasionally at least some of emotions are accompanied by variables such as facial expressions, bodily changes, and motor actions (Frijda, 1988; Frijda & Swagerman, 1987). Long-term outcomes include the effects of chronic emotional patterns regarding social functioning, subjective well-being, and somatic health.

### **Emotion terminology: A classification and measurement**

The language of emotion has been a topic in several articles (e.g. Jenkins & Oatley, 1996; Johnson-Laird & Oatley, 1989; Lazarus, 1991; Oatley & Jenkins, 1996; Ortony & Clore, 1989). Some common classifications of emotional experiences can be presented. First of all, researchers have mostly considered emotions as an internal and psychological experience (affective state) rather than an external state (e.g. Ortony & Clore, 1989). Secondly, along with the term emotion, the concepts of affect and feeling have widely been used in describing human emotional experiences. The term affect was used in the older psychological literature and is usually thought to imply a wider spectrum of total human emotionality than the concept of emotion (Oatley & Jenkins, 1996). Also the term feeling is assumed to imply a broader range of emotional experiences than the term emotion.

The third classification, proposed by Spielberger (1966, 1972), is the distinction between a state and trait. The term trait refers to a characteristic of a person, and therefore it is more like a tendency or disposition to react with an emotion. The concept of state, instead, refers to a specific condition in which a person feels or reacts with an emotion. For example, it is different to feel angry (state) than to be an angry person (trait) (Lazarus, 1991).

The fourth classification has been made between autonomic reactions (facial expression and body changes), subjective self-reported emotions, moods, emotional disorders, and personality traits, which are considered to indicate the whole spectrum of human emotionality (see Jenkins & Oatley, 1996, for a review). One way to differentiate these concepts is from a temporal perspective. Emotional autonomic reactions are reported to last usually only a few seconds. Self-reported emotional states can last for minutes or hours, whereas moods typically last for hours, days, or weeks. Emotional disorders, instead, usually endure at least months or years, and personality traits may last a lifetime. However, the relationship among these categories is still not well understood and, for instance, Lazarus (1991) has argued that the time perspective can not alone differentiate these terms.

As mentioned earlier, emotions can be classified as pleasant, positive (e.g. joy, happiness, and love), and unpleasant, negative (e.g. anger, hate, and anxiety). Emotion is felt as positive when a goal is advanced and negative when a goal is impeded (Oatley & Jenkins, 1996). The idea of differentiating emotions into two distinct types has been preliminarily proposed in developmental

psychology by researchers exploring the emotions of early childhood (see Lazarus, 1991; Oatley & Jenkins, 1996, for a review). The pleasant-unpleasant distinction, known also as a hedonic tone, has been supported by many researchers (e.g. Ortony, Clore & Collins, 1988; Lang, Bradley & Cuthbert, 1990; Shaver, Schwartz, Kirson & O'Conner, 1987; Zevon & Tellegen, 1982) and has been further shown to be relatively independent (e.g. Diener & Emmons, 1985; Warr, Barter & Brownbridge, 1983). In other words, pleasant and unpleasant feelings usually occur by themselves and they are not tightly linked.

Another way to differentiate or classify the terminology of emotions is the use of emotion categories (or dimensions). Research on this topic has been quite popular in social and cognitive psychology (see e.g. Lazarus, 1991; Ortony et al, 1988; Shaver et al, 1987, for a review). This approach categorises emotions into groups of closely related affective states. For instance, feeling angry can be categorised as consisting of several closely related emotions such as annoyance, rage, fury, hostility and so on (Shaver et al, 1987). These distinct but strongly overlapping concepts can be further differentiated by their strength or weight (within-category strength). For instance "annoyance" is considered to indicate the emotion anger with mild strength, whereas "rage" is considered to represent intense anger.

A relatively similar approach based on facial expressions and autonomic body changes is the classification between basic (primary) and secondary emotions. In this approach emotions are treated as "families", which consist of certain basic emotions and secondary emotions (see e.g. Ekman, 1992). Each emotion family is considered not as a single affective state but a family of related states including certain similar characteristics, such as in expression, in physiological activity, in the nature of the antecedent events which call them forth, and in the appraisal processes. Until this day, researchers have, however, not achieved general consensus about the list of basic emotions (see Ortony et al, 1988, p. 27, for a review). This approach has not been taken into account in the competitive sport context.

Emotion has also been classified from the perspective of measurability (e.g. Eysenck, 1975; Lazarus, 1991). Four various observable and measurable variables have been proposed: a) physiological concomitants of emotions, consisting of respiratory and cardiovascular, biochemical, and electrophysiological assessments, b) behavioural manifestations or actions, including, for instance, assessments of non-verbal expressive indices (facial expressions); c) verbal introspective self-reports; and d) environmental events and contexts, consisting of the social, cultural, and physical events in which an emotion occurs. Many studies in the past decade have tried to integrate subjective variables, physiological variables, and behavioural variables, but have found only low correlations (e.g. Sonnemans & Frijda, 1994). Therefore, the most popular method, subjective self-report questionnaires, have been agreed to represent the most reliable and practically only tool that researchers have on the measurements of conscious, subjective emotional experiences (Barret, 1996), especially outside the laboratory, in the context of people's daily lives (e.g. Feldman, 1995; Oatley & Duncan 1994). However, in the sport setting, the introspective verbal self-report method is not without drawbacks (see

Hackfort & Schwenkmezger, 1989, 1993; Harger & Raglin, 1994; Landers, 1980; Neiss, 1988, for a discussion).

In addition, several discrete measurable dimensions have been proposed for studying emotions, including, for instance, valance, intensity, direction, and duration (see Zammuner, 1998, for a review). However, the use of emotion dimensions is still quite inconsistent among the researchers, especially in the sport psychology literature. This topic will be elaborated in next section.

### **Terminology of emotion research in the sport setting**

In the sport psychology literature, concepts such as stress, arousal, and anxiety (see e.g. Cox, 1994; Gould & Krane, 1992; Lazarus, 1993; Wrisberg, 1994, for a definition) have dominated research describing the emotion-performance relationship. However, recently many researchers (Cox, 1994; Gould & Krane, 1992; Hanin, 1997a; Jones & Hardy, 1989; Morgan, 1997; Raglin, 1992) have reported the interchangeable use of these conceptually distinct terms. During the past decade, the terminological confusion has become even worse after researchers argued that anxiety is a multidimensional rather than unidimensional phenomenon (Burton, 1988; Gould, Petlichkoff, Simons & Veveva, 1987; Martens, Vealey & Burton, 1990). The concepts of cognitive anxiety and somatic anxiety, which were familiar in the test-anxiety literature (Borkovek, 1976; Davidson & Schwartz, 1976; Liebert & Morris, 1967), have become the key terms in the literature of the emotion-performance relationship.

To clarify the terminology used in the literature, Gould and Krane (1992) introduced a conceptual model which includes two separate components: physiological and cognitive interpretation-appraisal. The cognitive component was further divided into physiological arousal (somatic anxiety), negative affect (cognitive anxiety), and positive affect. Nonetheless, Hanin (1997a) has argued that in the literature the concept of dimensionality has been oversimplified to refer solely to different components of anxiety. Additionally, Hanin has debated that none of the existing orientations used in the literature of the emotion-performance relationship offer an integrative framework for a systematic description of the basic dimensions. Therefore, it is not clear what components of anxiety or other emotions should be examined and what the inter-relationship is between them. It is also unclear if the currently used terms, such as somatic and cognitive anxiety, can be used in descriptions of other emotions, for instance, somatic anger or cognitive joy. Within the framework of the IZOF model, Hanin (e.g. 1993; 1997a) has proposed his own conceptual clarification, which consists of five basic dimensions: form, content, intensity, time, and context (see chapter 3.1 for a more detailed description). Following this classification, it can be seen that emotion research in the sport setting has up to the present day been mainly limited to the measurements of the intensity dimension, which has been indicated as the level of activity, arousal, activation, or strength.

Recently, the impact of emotions on goal-oriented efficient performance has also been considered in the sport psychology literature (Jones, 1995a, b; Hanin, 1978, 1986, 1997a). Until these preliminary studies, the dominant

assumption was that the consequences of emotions on human behaviour are connected with the distinction between positive and negative emotions. Negative emotions, such as competitive anxiety, are assumed to have harmful consequences, whereas positive emotions are expected to have helpful consequences on athletic performance. However, these two myths have been challenged. For example, Jones and his colleagues examined how much a situational attribution of anxiety symptoms are either facilitative or debilitating with respect to athletic performance (see Jones, 1995a, b, for a review). Hanin (1978, 1986), instead, used different strategy by asking athletes to indicate the level or zone of anxiety in which the feeling facilitates their performance the most (zones of optimal functioning). Recently, within the framework of the IZOF model, Hanin (1993, 1997a) has extended the impact factor to consider a wider range of positive and negative emotions. By doing this, Hanin has integrated two independent factors: positive vs. negative emotions and optimal vs. dysfunctional effects of emotions. This results in four emotion categories: positive and optimal, negative and optimal, positive and dysfunctional, and negative and dysfunctional (this issue will be elaborated in chapter 3.1). It is notable that the facilitative and debilitating effect of anxiety has been widely recognised in the test anxiety literature.

During the past decade many researchers have questioned whether the current concepts (e.g. stress, arousal, anxiety) are enough to describe a relationship as complex that between emotional experiences and athletic performance (Gill, 1994; Gould & Urdy, 1994; Gould & Tuffey, 1996; Hahn, 1989; Hanin, 1993, 1997a, b; Jones, 1995a; Kerr, 1997; Landers, 1994; Lazarus, 1993; Males & Kerr, 1996). Therefore, a need to extend the work on this topic to consider other performance-related emotions has been advocated. Still today, the sport psychology literature holds only a few terms, such as self-confidence, optimal experience (flow), enjoyment, and anger, that have been introduced by researchers for the study of emotional experiences related to athletic performance as an addition to the concepts of stress, arousal, and anxiety (e.g. Bandura, 1977; Csikszentmihalyi, 1975; Coulomb & Pfister, 1998; Scanlan & Simons, 1992). Several studies have further examined emotions using discrete categories or dimensions. These studies have been conducted using standardised emotions scales such as Profile of Mood Scale (POMS) (McNair, Lorr & Droppleman, 1971), Positive and Negative Affect Schedule (PANAS) (Watson, Clark & Tellegen, 1988). The main findings of the studies using these concepts will be reviewed in chapter 2.3.

To sum up, emotion can be considered as a process in the person-environment relationship, which consists of antecedent demands, mediating appraisal and coping, and outcome. The process integrates the three constructs of mind: affect, motivation, and cognition. With reference to the present investigation, emotion is assumed to be a subjective emotional experience lasting from minutes to hours. It is more like a state (situational) than trait (enduring disposition). The terms affect and feeling are considered as closely related forms for the concept of emotion, and even though they are somewhat discrete they are treated as synonyms. However, emotion is differentiated from the concepts of mood, disorder, and personality trait, but may occasionally be



accompanied by autonomic emotional reactions. These emotion characteristics form the basic constructs for the conceptual framework of this study.

## **2.2 Limitations and concerns in the existing models and theories**

In the sport psychology literature, the relationship between emotions and athletic performance has been mainly studied with a limited number of emotions such as anxiety and self-confidence. In the most cases these studies have centred on testing theoretical orientations borrowed from other fields of science and non-sport settings. The most popular theoretical approaches have been the drive theory (Hull, 1943, 1952), inverted-U hypothesis (Yerkes & Dodson, 1908), multidimensional anxiety theory (Martens, Vealey & Burton, 1990), catastrophe model (Fazey & Hardy, 1988; Thom, 1975), reversal theory (Apter, 1982, 1984), mental health model (Morgan, 1979, 1980), and Zones of Optimal Functioning (ZOF) model (Hanin, 1978, 1986). Table 1 reports a summary of recent reviews and an overview on the main limitations and concerns of the studies testing these orientations.

The limitations and concerns seem to be largely centred on several conceptual and methodological problems with the result that none of these models has received overall support by researchers. In addition to the conceptual problems (e.g. terminological confusion and dimensionality) discussed in chapter 2.1, the possible methodological considerations and common shortcomings of these models are presented below.

TABLE 1 Recent reviews, main limitations and concerns of the current theoretical orientations describing the emotion-performance relationship

---

|                               |
|-------------------------------|
| Model                         |
| Recent reviews                |
| Main limitations and concerns |

---

|   |
|---|
| Drive theory  |
| Cox (1994); Jones (1995b); Zaichkowsky & Takenake (1993)                            |
| too simple to explain motor / sport performance (e.g. Weinberg, 1990)               |
| has a lot methodological and statistical problems (e.g. Neiss, 1988)                |
| supported only with very simple tasks (Martens, 1974)                               |
| Inverted-U hypothesis   |
| Cox (1994); Jones (1995b); Raglin (1992); Zaichkowsky & Takenake (1993)             |
| lack of empirical support (e.g. Neiss, 1988)  |
| does not consider the multidimensional nature of anxiety (e.g. Fazy & Hardy, 1988)  |
| does not offer theoretical explanations for the relationship (e.g. Landers, 1980)   |
| too simple to explain relationship (Mahoney & Meyers, 1989; Weinberg 1989)          |
| Multidimensional anxiety theory   |
| Gould & Krane (1992); Gould & Urdy (1994); Jones (1995b)                            |
| inconsistent empirical findings (Jones, 1995b)                                      |
| no functional explanations for somatic anxiety (Gould & Krane, 1992)                |
| lack of investigations (Gould & Krane, 1992)  |
| separate effect of cognitive and somatic anxiety (e.g. Hardy & Parfitt, 1991)       |
| Catastrophe model   |
| Gould & Krane (1992); Hardy (1996); Jones (1995b)                                   |
| overly complex and difficult to test (Gill 1994; Gould & Krane, 1992)               |
| lack of investigations (Gould & Krane, 1992)  |
| no explanation of why and how emotions are performance facilitative or debilitating |
| Reversal theory   |
| Jones (1995b); Kerr (1997); Zaichkowsky & Takenake (1993)                           |
| difficult to test (Jones, 1995b)  |
| based upon unidimensional conceptualisation (Jones, 1995b)                          |
| lack of investigations (Gould & Krane, 1992)  |
| Mental Health Model   |
| Kerr (1997); Morgan (1997); Rowley et al. (1995)                                    |
| lack of empirical support (Rowley et al, 1995; Terry, 1995)                         |
| methodological problems (see Kerr, 1997 for a review)                               |
| ZOF model   |
| Gould & Tuffey (1996); Hanin (1995a); Jones (1995b); Raglin (1992)                  |
| lack of in-depth empirical data (Gould & Tuffey, 1996)                              |
| based on unidimensional conceptualisation (Gould & Tuffey, 1996; Jones, 1995b)      |
| no explanations on the functionality of the ZOF (Gould & Krane, 1992)               |

---

A common deficiency of all the orientations seems to be the lack of explanation regarding the impact of emotions upon performance. This is not surprising, since the functional meaning of the impact of emotion has practically never been examined in the competitive sport setting. However, a few possible constructs explaining how emotions influence performance have been proposed in the literature. These constructs have focused on attentional changes

(Esterbrook, 1959; Nideffer, 1976), kinematics of movement (Beuter & Duda, 1985; Beuter, Duda & Widule, 1989), and muscle tension and co-ordination (Weinberg & Hunt, 1976). Descriptions of these constructs can be also found in several recent reviews (Gould & Tuffey, 1996; Nideffer, 1989; Zaichkowsky & Takenaka, 1993). Within the framework of the IZOF model, Hanin (1997a) has proposed an alternative construct; see chapter 3.1 for a description.

Methodologically the studies testing the models on the emotion-performance relationship seem to share several crucial characteristics that might explain the limitations and concerns reported in Table 1. First of all, the notion that most of the existing theoretical approaches have initially been developed outside a sport setting might cause several practical problems. The criticism on the complexity of the models (e.g. Gill, 1994) could be one such problem.

Another characteristic is the notion that the research testing the emotion-performance relationship has been almost completely based on examinations of universal, same-for-all, curves. According to Hanin (e.g. 1997b) these curves underestimate the inter-individual differences and intraindividual dynamics of subjective emotional experiences. Hanin's argument, in fact, raises the question of the usefulness of nomothetic or idiographic approaches, which have been quite popular topic in the recent literature (e.g. Dunn, 1994; Gould & Krane, 1992; Hackfort & Schwenkmezger, 1989; Morgan, 1997; Weinberg, 1990). Several other researchers have also declared a need of studies using idiographic approaches (Gould & Krane, 1992; Morgan, 1997; Weinberg, 1990). However, some researchers (Dunn, 1994; Hackfort & Schwenkmezger, 1989; Weinberg, 1990) have suggested that the most effective results can be obtained by combining both approaches. According to Dunn (1994), the combined use of nomothetic and idiographic methodologies provides the possibility to validate nomothetic principles at the individual level while, simultaneously, nomothetic hypotheses can be generated from idiographic analyses.

A reason for the dominance of nomothetic procedures could be due to the use of standardised scales with researcher-generated (fixed) content. Since the state-trait anxiety theory (Spielberger, 1966, 1972) was developed, an enormous interest has been shown by sport psychologists on the development of a valid self-report scale for testing anxiety. Such scales as the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch & Lushene, 1970) and Competitive State Anxiety Inventory-2 (CSAI-2) (Martens, Burton, Vealey, Bumb & Smith, 1990) have dominated investigations on anxiety in the last three decades. Also, a Profile of Mood Scale (POMS) (McNair et al, 1971) has been occasionally used in the competitive sport setting. Consequently, most of the research examining the emotion-performance relationship has been conducted by using these standardised scales. However, Hanin and his colleagues (Hanin, 1993, 1996; Hanin, Jokela & Syrjä, 1998; Syrjä & Hanin, 1997) have outlined some problems in using them.

First, Hanin (1993, 1996) has demonstrated that the content of these scales reflects the combined effect of positive and negative emotions. For instance, the STAI scale consists of 10 negative and 10 positive items. A low score in the STAI test indicates anxiety-absence and high score in the test reflects anxiety-present

(Spielberger et al, 1970). Consequently, Hanin has levelled the criticism that anxiety, as a negative emotion, can not be measured by the reversal of anxiety-absent items (positive). Examinations into the other anxiety-based standardised scales revealed that each of them includes both positive and negative items. These arguments question the use of standardised scales measuring a single emotion. In fact, it seems that all the earlier studies using the anxiety-based instruments (e.g. STAI and CSAI-2) have considered the balance and imbalance of positive and negative emotions.

Second, the content of the standardised scales seems to have a low relevance for individual athletes. Recently, Hanin and his colleagues (Hanin, Jokela & Syrjä, 1998; Syrjä & Hanin, 1997) have shown that the researcher-generated "fixed" content of the standardised scales is individually irrelevant. The similarity of the emotion content between the standardised scales STAI, CSAI-2, POMS, and Positive and Negative Affect Schedule (PANAS) (Watson et al, 1988) and individualised emotion scales was revealed to be very low, ranging only from about 10 to 20 %. These findings question the content relevancy of the normative scales in the sport setting. Also, Kerr (1997) has questioned the validity of the content of the CSAI-2 scale.

Another methodological concern that researchers have addressed is the operational definition of performance in studies examining the emotion-performance relationship (see e.g. Gould & Krane, 1992; Gould & Tuffey, 1996; Hanin, 1997a; Jones, 1995a; Raglin 1992; Weinberg, 1990, for a discussion). The use of outcome scores such as finishing position, time, distance, scores or the win / lose ratio has been shown to be the main drawback in these investigations. Consequently, in recent years, researchers have emphasised the importance of intraindividual level analysis in either subjective or objective measurements, and the use of process, instead of outcome, in rating athletic performance.

To summarise, the existing theoretical orientations examining the emotion-performance relationship have a number of conceptual and methodological limitations and weaknesses. The conceptual confusion, the problems with dimensionality (see chapter 2.1), the dominance of the borrowed universal models, the dominance of nomothetic approaches, and methodological problems using scales with standardised researcher-generated content and in measuring performance level are assumed to be critical issues in explaining the inconsistent evidence obtained in the research testing the emotion-performance relationship. One alternative for avoiding these limitations and concerns is the use of a more reality-grounded, idiographic, and conceptually holistic approach taking into account a wider range of emotional experiences, both negative and positive.

### **2.3 Emotion research in the sport setting**

Since there seems to be a high consensus among researchers that emotions play an important role in sport-related human activities, it is surprising how

narrowly emotions have been studied during the past three decades in sport. In fact, the work on emotions has been dominated by stress-related (threat) emotions such as anxiety. The dominance of anxiety research has been so overwhelming that other performance-related emotions have been either underestimated or completely ignored (Gill, 1994; Gould & Tuffey, 1996; Gould & Urdy, 1994; Hanin, 1993, 1994, 1997a; Jones, 1995a; Kerr, 1997; Landers, 1994; Males & Kerr, 1996). However, recently several other emotion constellations can be observed in the sport psychology literature. Self-confidence has received rather wide attention among researchers and the concept has been integrated into the multidimensional anxiety theory (Martens et al, 1990). Furthermore, especially during the last decade investigations of optimal experience regarding terms such as flow has become a popular research topic. Also, the term anger has to some extent been investigated in the sport setting, although its relationship to performance has not been described and this work has mainly centred on a consequence of this emotion (aggressive behaviour). Recently, several studies have examined athletes' emotional experiences using the scales of emotion categories or dimensions. Two standardised scales, the POMS (McNair et al, 1971), with five dimensions (tension, depression, anger, fatigue, confusion, and vigor), and the PANAS (Watson et al, 1988), with two dimensions (pleasant and unpleasant), have been utilised in sport-related emotion research.

Emotion research in the sport setting will be considered here from two discrete perspectives. First, studies examining single emotion constellations, and second, studies on discrete categories of emotions will be briefly reviewed.

### **Single emotion constellations**

*Anxiety.* Anxiety, thought of as a self-reported subjective feeling, has been primarily studied by analysing its relation to athletic performance. Although anxiety research in sport has been well reviewed in recent publications (e.g. Cox, 1994; Gould & Krane, 1992; Jones, 1995a; Kerr, 1997), several major issues merit attention.

First, the anxiety-performance relationship has typically been analysed by testing the universal curves of several theoretical orientations (see chapter 2.2). Thus, most studies testing the relationship have been limited to the comparisons of these theoretical curves and current anxiety levels. In other words, the studies have examined the relationship using only the intensity perspective. Nevertheless, the individually optimal intensity level has not been described except in few ZOF-based investigations (e.g. Hanin, 1978, 1986). Using the Russian version of the State-Trait Anxiety Inventory (Hanin & Spielberger, 1983), Hanin demonstrated that each athlete has his own optimal zones of pre-competition anxiety ( $\pm 4$  points) indicating his highest probability for successful performance execution. These ZOF scores have been shown to be either low, moderate, or high depending on the athletes. Several recent investigations have supported these findings (see Hanin, 1995a, 1996, for a review). Hanin has further proposed that for the anxiety-performance relationship, there is a need for individualised criteria to evaluate the intensity

of current anxiety. In other words, Hanin recommends that it is not the current level, but how far the current anxiety state is from person's individually optimal zones (ZOF) that counts in predicting athletic performance. A number of investigations have provided support for this principal; see the results of meta-analysis (Jokela & Hanin, 1997). However, individually dysfunctional anxiety levels have never been indicated in any of these studies.

Second, until quite recently (Bejek & Hagtvvet, 1996; Hanin, 1993, 1996), the analysis of the content of anxiety has been completely ignored. Typically, due to the use of standardised self-report emotion scales with researcher-generated content, anxiety has, without question, been assumed to have a universal, usually negative, effect on performance. This notion has been challenged in the several recent studies (e.g. Hanin, 1978, 1986; Jones, 1995a; Morgan, O'Connor, Sparling & Pate, 1987).

Third, although the temporal perspective of anxiety states has been taken into account in several studies (e.g. Gould, Petlichkoff & Weinberg, 1984; Martens, Vealey & Burton, 1990; Parfitt & Hardy, 1987; Swain & Jones, 1992), it has mainly been limited to pre- and post-performance situations. Only little work, mainly in a laboratory setting, has explored the changes that occur during the activity (e.g. Tate & Petruzzello, 1995). Consequently, up to the present, the description of temporal patterns of anxiety is limited to the dynamics of pre- and post-competitive anxiety states. Changes in anxiety states during a season or over several seasons has been investigated at least in several studies (e.g. Gould, Tuffey, Hardy & Lochbaum, 1993; Krane, 1993; Raglin, Morgan & Wise, 1990; Swain & Jones, 1996).

A recent direction in anxiety research has been an analysis of the separate and joint effects of various anxiety components (e.g. cognitive and somatic anxiety) on performance (see e.g. Jones, 1995a, for a review). The multidimensional nature of anxiety is based on the framework of the test anxiety approach and has challenged the uni-conceptual orientations (the drive theory and inverted-U hypothesis). This line of research is promising but so far the empirical findings have centred on the description of the universal effect on performance, ignoring athletes' idiographic characteristics.

*Self-confidence.* Research on self-confidence in the sport setting has primarily focused on investigating the parameters of Bandura's (1977) self-efficacy theory. According to the theory, the sources of self-efficacy are performance accomplishments, vicarious experiences, verbal persuasion, and physiological states (emotional arousal). These sources have been explored and extended in recent studies (Vealey, Hayashi, Garner-Holman & Giacobbi, 1998). Examinations describing the relationship between self-confidence and performance have mostly been based on studies using the CSAI-2 instrument. In these investigations, the assumption that a causal link exists between self-confidence and performance has been tested, leading to quite inconsistent findings (see e.g. Jones, 1995a, b; Morgan, 1997 for a review).

*Optimal experience - flow - enjoyment.* In the last few decades, optimal experience has become a quite popular topic among researchers (see McInman and Grove, 1991, for a review). The optimal experience has been described as a special episode of superior functioning related to positive stress (eustress: see

Harris, 1970). It has been further defined as focused awareness on the act and on the self. These special episodes have been conceptualised as a peak performance (Privette 1983), peak experience (Maslow, 1971; Ravizza, 1977), ideal performance (Uneståhl, 1986), and flow (Csikszentmihalyi, 1975). The most of this work has centred on describing the flow experience (e.g. Catley & Duda, 1997; Csikszentmihalyi, 1990; Jackson, 1996; Jackson, Kimiecik, Ford & Marsh, 1998; Jackson & Marsh, 1996).

Flow research was initially based on analyses of optimal experiences related to highly demanding activities, such as playing chess, rock climbing, and surgery (Csikszentmihalyi, 1975, 1990). The model of flow state (Csikszentmihalyi, 1990) proposes nine defining characteristics of optimal experience: challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task at hand, paradox of control, loss of self-consciousness, transformation of time, and autotelic experience. In a recent study, 28 elite athletes from seven different sports were interviewed and the data were analysed to examine whether Csikszentmihalyi's nine characteristics could be found in the athletes' answers (Jackson, 1996). The results showed that it was possible to categorise 97 % of the raw data themes into one of the nine flow dimensions. Another recent study examined the relationship between pre-performance readiness factors and post-game ratings of intensity and frequency of flow in 163 recreational golfers (Catley & Duda, 1997). The readiness factors were confidence, positive thinking, motivation, level of relaxation, mental focus, and physical readiness. The results indicated that these factors were significantly related to the experience of flow.

Furthermore, it has been suggested that the term enjoyment can be conceptualised as flow (Csikszentmihalyi, 1993; Kimiecik & Harris, 1996). In the literature, enjoyment has been considered as a primary construct for understanding and explaining athletes' motivation and experiences in sport and exercise (Scanlan & Simons, 1992; Wankel, 1993). Therefore, research on enjoyment in sports has typically been based on the study of motivation. For instance, Wankel has stressed two crucial roles that enjoyment has in physical activity. First, enjoyment is assumed to have a facilitative effect on continuing involvement in the activity and thus resulting in health benefits. Secondly, enjoyment is expected to decrease stress and facilitate positive psychological health. Sources of sport enjoyment has also been studied (see Scanlan & Simons, 1992, for a review). Despite the increasing interest in enjoyment among researchers, these studies have not clarified whether a relationship exists between enjoyment and performance.

*Anger - hostility - aggression.* The AHA syndrome (Spielberger, Krasner & Solomon, 1988) is a structure of three concepts: Anger, Hostility, and Aggression. Anger is considered as a state emotion and hostility as a trait, a tendency for emotion, whereas aggression is reserved for the behavioural expression of the first two. In the sport setting, research on anger has been mainly based on the observation of athletes' violent behaviour (aggression) in contact team sports (e.g. Coulomb & Pfister, 1998; Russell & Arms, 1995; Widmeyer & McGuire, 1997). For instance, Coulomb and Pfister (1998) analysed the effect of competition level on aggressive behaviour during the course of

play within two dimensions: hostile and instrumental aggression. Using an extensive observation schedule, 45 French Championship soccer games from three different competition levels were analysed. The results indicated that hostile behaviour occurred more frequently during the second half of a match than in the first, whereas instrumental aggression occurred more often in the first half of the game. The level of competition had a partial influence on aggressive behaviour. On a higher level of competition, a greater frequency of instrumental aggression was observed, while hostile behaviour occurred less frequently.

Even though research in recent years has taken into account a larger variety of emotions, as an extension of anxiety research, it is still limited to a very narrow range of the total emotional experiences related to athletic performance. In fact, a lot of this work on single emotions has examined only consequences (e.g. aggressive behaviour), sources, or concomitants (e.g. motivation) of emotions. The impact of emotions on athletic performance has in most cases been completely ignored. Thus, it is still unclear what are the most typical and / or crucial emotions, both positive and negative, that are related to sport-related performance. More studies emphasising the wider spectrum of emotional experiences are needed.

### **Emotion categories or dimensions**

In the competitive sport setting, only a few scales considering emotions as categories or dimensions have been utilised in earlier research. The most popular such scale has been the POMS (McNair et al, 1971), which essentially was a clinical instrument for measuring mood states. The POMS contains five negative dimensions (tension, depression, anger, fatigue and confusion) and one positive dimension (vigor). The most of the work using the scale in the sport setting has centred on testing Morgan's (1979, 1980) Mental Health Model, with quite inconsistent results (see Rowley, Landers, Balin Kyllö & Etnier, 1995; Terry, 1995, for a review). However, the findings have clearly indicated that number of mood states are related to athletic performance (e.g. Prapavessis & Grove, 1991; Prapavessis, Berger & Grove, 1992).

Recently, a well-known self-report emotion scale, PANAS (Watson et al, 1988) has also been utilised in the sport setting. The PANAS was originally developed as a brief psychometrical tool for the measurements of two conceptually independent mood dimensions: positive affect and negative affect. In the sport setting, research using PANAS has centred on an analysis of the interrelations between positive-negative affect, anxiety components, and self-efficacy (Jones, Swain & Harwood, 1996; Treasure, Monson & Lox, 1996). For instance, Treasure and his colleagues studied the relationships between self-efficacy, performance, and positive and negative affect in 70 male high school wrestlers ( $M = 16.0$  years). The findings showed that self-efficacy associated positively with positive affect and negatively with negative affect, cognitive anxiety, and somatic anxiety. However, the dimensions of emotions (pleasant and unpleasant) were not contrasted with performance and therefore the emotion-performance relationship was not directly studied. Crocker (1997) has



further shown that in the sport context the validity of the PANAS scale for measuring physical activity is only partially supported.

Investigations treating emotions as categories have shown that there exist a number of discrete emotions that are related to athletic performance. However, these studies have still been limited to the use of normative instruments with researcher-generated content examining a relatively narrow range of emotions (categories). Thus, a future goal for researchers is to develop a new reliable and valid sport-specific emotion scale covering the whole range of the most critical and individually relevant performance-related emotions. A promising new procedure emphasising the idiographic nature of performance-related emotions is individualised emotion profiling, introduced by Hanin (1993, 1994, 1997a, b; Hanin & Syrjä, 1995a, b) as a part of the methodological framework of the IZOF model. Several studies have been conducted using this procedure (Bortoli et al, 1997; Hamill, 1996; Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b, 1997; Johnson et al, 1995; Rodazza et al, 1998; Strand & Wedman, 1999; Syrjä, Hanin & Pesonen, 1995; Syrjä, Hanin & Tarvonen, 1995). The findings of these studies will be reviewed in chapter 3.2.

### 3 HANIN'S IZOF MODEL

Recently, Hanin (e.g. 1993, 1995b, 1997a, b) has proposed as an extension to the earlier anxiety-based ZOF approach (e.g. Hanin, 1978, 1986, 1995a, 1996) a new development called the Individual Zones of Optimal Functioning (IZOF) model. The extended model takes into account a wider range of emotions, both positive and negative, and thus it is presented as a conceptual framework for the qualitative and quantitative analysis of individual subjective emotional experiences related to athletic performance. The model is based on findings and observations from the naturalistic real-life setting of elite sports. In this chapter, the extended model will first be introduced by considering its basic propositions. Then the earlier IZOF-based studies will be reviewed.

#### 3.1 Basic propositions

Within the framework of the IZOF model, Hanin (1997a) has conceptualised four central basic propositions: a) the multidimensionality of emotional experiences; b) the content of emotions; c) the in-out of the zone principle; and d) the functional interpretation of the impact of emotion upon performance.

*The multidimensionality of emotional experiences.* Instead of using systems based on terms such as cognitive and somatic anxiety, arousal, or behavioural, which are central to the most of the existing orientations, Hanin (1997a) has proposed a more global conceptualisation. This terminological clarification is based on Ganzen's (1984; cited in Hanin, 1995a, p. 110) work relating to the systems descriptions in psychology. Initially, Hanin modified Ganzen's PENTA dimensions - substrate, energy, information, space, and time - for the

description of communication and optimal anxiety states (Hanin, 1992, 1995a). Within the framework of the IZOF model the PENTA construct includes five basic dimensions of form, content, intensity, time, and context for a systematic description of performance emotions (Hanin, 1997a). For each of the five dimensions Hanin has further described several sub-components (see figure 1). Thus, emotional experiences as the affective form component of performance psychobiosocial states could be studied within four central dimensions: content, intensity, time, and context.

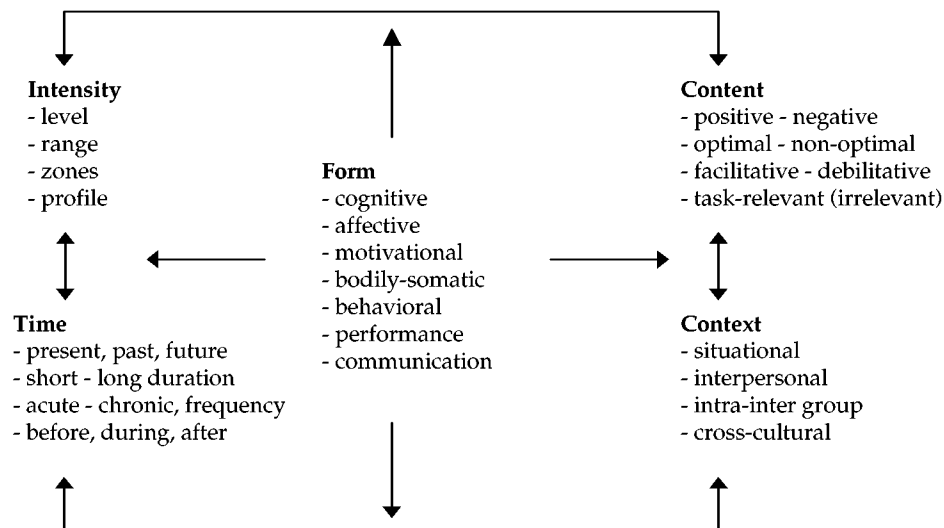


FIGURE 1 Multidimensional psychobiosocial states of performance emotions (from Hanin 1997a, p. 35)

It is noteworthy that the sub-components of the form dimension (see Figure 1) could be classified into a further three aspects: a) the components of the human mind (affective, cognitive and motivational); b) the component of the human body (bodily-somatic and motor-behavioural); and c) the social interaction between the individual and the environment (performance-operational and communicational).

*The content of emotions.* In the IZOF model the emotion content is conceptualised within the framework of two closely related but independent factors. The first factor concerns the distinction between positive, pleasant, and negative, unpleasant, emotions. The second regards the helpful or harmful effect of emotions upon human behaviour, which are conceptualised to be either optimal or dysfunctional. Using these independent factors (positive-negative and optimal-dysfunctional), four emotion categories have been proposed for the systematic analysis of individually relevant emotional experiences related to successful and unsuccessful performance (Hanin, 1993, 1995b, 1997a; Hanin & Syrjä, 1995a). The four emotion categories are:

- a) positive, pleasant, and helpful, optimal, emotions (P+);

- b) negative, unpleasant, and helpful, optimal, emotions (N+);
- c) positive, pleasant, and harmful, dysfunctional, emotions (P-); and
- d) negative, unpleasant, and harmful, dysfunctional, emotions (N-).

It is assumed that these four categories are relevant for a description of athletes' emotional experiences before, during, or after performance. The validity of these emotion categories has been empirically substantiated in several studies (see Hanin, 1997a, for a review).

*The in-out of the zone principle.* The concept of in-out of the zone has been proposed as an individual criterion for describing and predicting the emotion-performance relationship. The principle assumes that the current emotion intensity is not so critical for performance as the distance between the current intensity and individually optimal or dysfunctional zones. Initially this principle was proposed for optimal anxiety (Hanin, 1978, 1986), however, the extended in-out of the zone concept was proposed to describe separate or joint effects of both positive and negative emotions, consisting of the four emotion categories (see above; Hanin, 1993, 1995b, 1997a).

The effect of emotion on performance is described by identifying for each athlete his / her individually relevant helpful emotions (P+ and N+) and their optimal zones related to successful performance and his / her individually relevant harmful emotions (P- and N-) and their dysfunctional zones related to unsuccessful performance. The P+ and N+ emotions and their optimal zones are assumed to indicate the highest probability of successful performance, whereas the P- and N- emotions and their dysfunctional zones are predicted to indicate the highest probability of poor performance. However, Hanin has argued that the separate or joint effect of positive and negative emotions on performance appears only in the interaction of optimal and dysfunctional effect. In other words, according to Hanin (1997a, p. 39) "although functionally optimal emotions are important predictors of successful performance, they alone may not be sufficient, if potential detrimental effect of dysfunctional emotions is not considered." Therefore, the in-out of the zone concept presents the separate and joint effect of positive and negative emotions by taking into account both optimal and dysfunctional effects on performance. Therefore, it is presumed that:

- a) individually best performance is expected when athlete's current emotion intensity is within (or close to) his / her optimal zones (P+N+) and outside his / her dysfunctional zones (P-N-);
- b) individually average performance is expected when athlete's current emotion intensity is a) within (or close to) both his / her optimal (P+N+) and dysfunctional (P-N-) zones, or b) outside both his / her optimal (P+N+) and dysfunctional (P-N-) zones;
- c) individually poor performance is expected when athlete's current emotion intensity is outside his / her optimal zones (P+N+) and within (or close to) his / her dysfunctional zones (P-N-).

*The functional interpretation of the impact of emotion on performance.* Within the framework of the IZOF model, the functional meaning of the impact of emotion

on performance has been described with two constructs: energy mobilization and energy utilization (Hanin, 1997a, b). It is assumed that emotions have four different functions on the basis of energy mobilization (effort, intensity) and energy utilization (efficiency, skill) distinctions. The four functions are a) energizing or energy mobilizing function (M+), energy de-mobilizing function (M-), energy utilization or regulation function (U+), and energy misuse or de-regulation function (U-). Initial empirical support for this construct has been obtained in Hanin and Syrjä's (1995a) study. Research on the functional interpretation of emotional impact needs to be clearly more indicated.

### 3.2 The IZOF-based research

On the basis of the propositions of the IZOF model, several investigations have examined emotional experiences related to successful and unsuccessful performance in different sports. Primarily this work has centred on analysing the content and intensity of emotions (Bortoli et al, 1997; Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b, 1997; Johnson et al, 1995; Rodazza et al, 1998); however, a few studies have tested the predictive validity of the in-out of the zone principle (Syrjä, Hanin & Pesonen, 1995; Syrjä, Hanin & Tarvonen, 1995). The main findings of these investigations will be reviewed.

*The content and intensity of emotions related to successful and unsuccessful performance.* Hanin and Syrjä (1995a) examined performance-related emotional experiences in 46 Finnish male ice-hockey players (age M = 16.3, SD = 0.6). In the study the players were requested to select from the stimulus list of the emotion descriptions 4-5 positive and 4-5 negative adjectives which best describe their emotions as related to successful and unsuccessful performances. The players were then asked to identify individually optimal intensity zones for each helpful emotion description and dysfunctional intensity zones for each harmful emotion description using Borg's (1982) CR-10 scale. This procedure called as individualised emotion profiling procedure is more specifically described in chapter 5.2.

The findings of the study indicated that each player's emotion descriptions always contained positive and negative optimal (P+ and N+) and positive and negative dysfunctional (P- and N-) adjectives. However, the results showed that the content of emotions was quite different between the players. The same emotion was observed to be optimal for some players and dysfunctional for the other player. From a total of 44 positive emotions 23 % were selected only as optimal, 11 % only as dysfunctional, while 66 % of words were used in both of these categories. Similarly, from a total of 37 negative emotions 18 % were only optimal, 41 % only dysfunctional, and 41 % were selected for both categories. Another finding of this study was that emotion descriptors could be categorised into three types including "core" or sport-specific adjectives (the most selected), idiosyncratic adjectives (selected only by one or two players), and non-specific or irrelevant adjectives (not selected).

These results brought the IZOF assumptions to bear on the content of emotions as an extension of the earlier anxiety-based studies (e.g. Hanin, 1978, 1986). The optimal and dysfunctional intensity zones were further observed to be low, moderate, or high and vary for the same and different emotions across different athletes. These findings have been supported in several other investigations within the same and across different sports (Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995b, 1997; Johnson et al, 1995).

In the same study by Hanin and Syrjä (1995a), optimal and dysfunctional zone ranges were further examined. Since in the initial ZOF model it was assumed that individually optimal anxiety is a range ( $\pm 4$  points in STAI scale) rather than a specific level (Hanin, 1978, 1986), Hanin and Syrjä studied whether the ice-hockey players preferred ranges in describing their intensity zones for optimal and dysfunctional emotions. It is noteworthy that the players in this particular study were instructed to identify their zones either using a single value (a specific level) or using several,  $> 2$ , values (a wider range). As expected, the results indicated that ice-hockey players preferred ranges (75 % of all cases). However, this finding was not confirmed in another study (Hanin & Syrjä, 1995b) in 25 soccer players (age  $M = 19.2$ ,  $SD = 1.0$ ). The soccer players used level (a single value) as an indicator of optimal and dysfunctional intensity zones in 86 % of cases. Nevertheless, players' different levels of awareness of their emotions could explain these inconsistent findings.

In another study (Hanin & Syrjä, 1997), 12 Finnish elite cross-country skiers (8 male and 4 female), ages 23-38, were asked to identify the content and intensity of emotions in three various performance tasks: competitive, hard work training, and technical skill training. The similarity of the content and intensity of these three emotion profiles were analysed. The amount of overlap was calculated to indicate the level of similarity of the emotion contents. The overlap scores show the amount of similarity of two lists ranging from 0, completely dissimilar, to 1, completely similar (see chapter 5.4). The intraindividual similarity of the emotion content between the tasks was found to be highest between competition and hard work training ( $M = 0.41$ ,  $SD = 0.28$ ) and the lowest between competition and technical skill training ( $M = 0.27$ ,  $SD = 0.23$ ). The overlap was 0.31 ( $SD = 0.22$ ) between hard work training and technical skill training. The optimal and dysfunctional intensity zones were found to be significantly different between these three tasks for the positive optimal (P+) (two-way anova;  $p < .02$ ), negative dysfunctional (N-) ( $p < .03$ ), and joint optimal emotions (P+N+) ( $p < .02$ ). These results also indicate that the IZOF concepts regarding the content and intensity of emotions are supported in different contexts.

Recently, two IZOF-based studies have been carried out by using a modified individualised emotion profiling method (Bortoli et al, 1997; Rodazza et al, 1998). In these investigations, the stimulus list of emotion descriptions, modified from Hanin's list (see chapter 5.2), included positive and negative adjectives randomly arranged. Athletes were asked to select from the list (or add their own words) up to 5 positive and 5 negative adjectives related to emotions in hypothetical or past optimal and poor performance. In addition, the athletes were asked to identify for each emotion their intensity and range using

Borg's (1982) CR-10 scale. Range contained the upper and lower limits of intensity regarding specific characteristics (pleasant or unpleasant) and effects on performance (facilitating or inhibiting). The athletes' interpretation of their emotions was then analysed using these four factors of facilitating, debilitating, pleasant, and unpleasant.

Bortoli and his colleagues (1997) used the procedure in a study on 60 male rugby players and 75 roller-skating hockey players. The results indicated that general negative (unpleasant) emotions such as "aggression", "anger" and "tension" were observed as facilitating pleasant, whereas, general positive emotions like "calmness", "relaxation" and "happiness" were perceived as debilitating and unpleasant. For instance, the emotion "anger" was described as facilitating-pleasant by 7 % of players, as facilitating-unpleasant by 37 % of players, as debilitating-pleasant by 2 % of players, and as debilitating-unpleasant by 8 % of players. Consistent with the findings of other IZOF-based studies (Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b, 1997; Johnson et al, 1995), the investigation indicated that positive and negative emotions related to successful and unsuccessful performance were different between the players, and all the pleasant and unpleasant emotions were observed to have both facilitating and debilitating effects on performance. However, the results further showed that the hedonic tone (pleasant - unpleasant) is dependent on individual interpretation. Similar findings were reported in another study (Rodazza et al, 1998). These findings extend the methodological procedure proposed within the framework of the IZOF model. According to these results, it seems that general adjectives representing positive and negative emotional states can not be integrated with the hedonic tone concept.

*The in-out of the zone principle.* To determine whether the in-out of the zone principle predicts the relationship between emotions and athletic performance has been empirically tested in two studies (Syrjä, Hanin & Pesonen, 1995; Syrjä, Hanin & Tarvonen, 1995). In Syrjä, Hanin and Pesonen (1995), 27 Finnish first division male junior soccer players, aged 15 to 17 years ( $M = 15.5$ ,  $SD = 0.57$ ), were first asked to construct their individual emotion profile by following the individualised emotion profiling procedure proposed by Hanin (e.g. Hanin & Syrjä, 1995a). The players were then asked using the emotion descriptions of the individual emotion profile to describe how they felt just before, during, and after three games and five practice sessions. The deviations of each player's current intensities from his optimal and dysfunctional zones were calculated across the whole sample. The players were further asked to subjectively self-rate their performance, and the ratings were then classified into three groups: successful, average, and poor. The Kruskal-Wallis test indicated that emotion deviations before, during and after the games were in 91 % of all cases significantly different between the performance groups. In practice sessions the groups were significantly different only in 38 % of cases, however the during-activity emotion deviations were found to be more frequently significant than the pre- and post-activity deviations. The correlation between the emotion deviations and performance was revealed to be significant and in the expected direction for 81 % of cases in games and 29 % of cases in practice sessions. These

findings indicate that the emotion deviations were different in the successful, average, and poor performance groups. A more significant difference was, however, found in games than in practice sessions. These results provide empirical support for the in-out of the zone principle. Similar findings were also revealed in Syrjä, Hanin and Tarvonen's (1995) study in squash and badminton players.

To summarise, several IZOF-based hypotheses can be proposed as an extension to the basic assumptions of the model. First, athletes differ greatly in describing their optimal and dysfunctional emotions related to successful and unsuccessful performance. Second, optimal and dysfunctional intensity zones can be low, moderate or high and vary for the same and different emotions across different athletes. Third, optimal and dysfunctional intensity zones are expected to encompass a range rather than be at a specific level. As we have seen, most studies so far, which have tested the IZOF assumptions have centred on the analysis of emotions within the content and intensity dimensions. The in-out of the zone principle has been considered in a few investigations with supportive findings. However, more research on all the dimensions of emotions (content, intensity, time, and context) is needed. Special emphasis in future studies should be given to the temporal dimension, which has not hitherto been considered in any earlier studies. For instance, Gould and Tuffey (1996) have specified the need for longitudinal studies to determine whether individual optimal zones change over time. In the present investigation this purpose was central.



## **4 CONCEPTUAL FRAMEWORK AND RESEARCH QUESTIONS**

In the sections below, the conceptual framework of the present study will first be described. The aim of the study and specific research problems and hypotheses will then be stated.

### **4.1 The conceptual framework of the study**

Conceptually this study is based on the lines proposed in the IZOF model. Using the concepts of the PENTA construct (see figure 1), the present investigation studied highly skilled soccer players' emotional experiences (affective form) related to game performance (competitive context) within the content, intensity, and time dimensions. Thus, the form and context dimensions had a permanent role in the study. However, even though subjective emotional experiences are presented within the affective form, they are assumed to be closely related to the other forms of psychobiosocial state. In other words, players' emotional experiences are partly assumed to be reflecting bodily-somatic reactions (e.g. arousal), motivational aspects, or, for instance, cognitive functions (e.g. the level of concentration). Hence, the present investigation could be considered as a study of players' meta-knowledge of their experiences relating to soccer performance.

The study utilises the possibilities of data gathered with the individualised emotion profiling procedure. In the procedure, emotional experiences were operationalised with descriptions of emotion, adjectives. The emotion descriptions were classified into four categories by two factors (hedonic tone and impact of emotions). The categories were a) positive and optimal (P+), b) negative and optimal (N+), c) positive and dysfunctional (P-),

and d) negative and dysfunctional (N-). Emotional experiences were also operationalized by taken into account their intensity (magnitude). Intensity of emotions was conceptualised as an optimal zone, representing typical intensities in successful performance, and as a dysfunctional zone representing typical intensities in unsuccessful performance. Emotion intensities were further measured in four international games, thus indicating situational (current) levels of intensity.

By their emotion descriptions and intensities players are expected to reflect task or game related demands or individual characteristics. The task-related emotion intensities (situational) reflect players' emotional states during preparation, mid-game activities and after the matches. The conceptual framework of the investigation is presented in Figure 2. The figure also shows how the research questions (see next section) are connected to the conceptual framework.

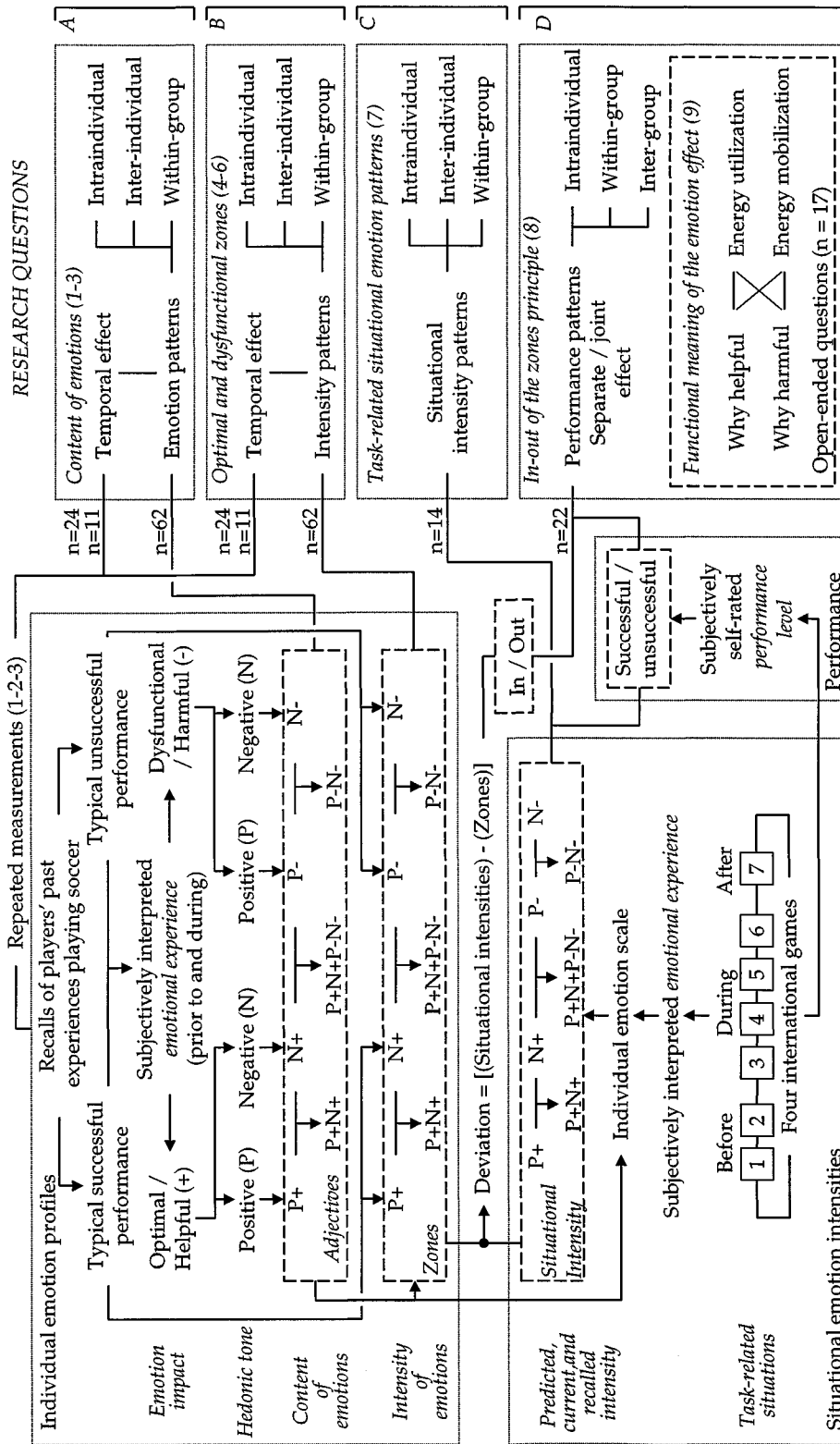


FIGURE 2 The conceptual framework of the study (→ = the design of the data collection; |□□□ = data; — data-question / sub-question connection)

## 4.2 The aim of the study

The aim of the present investigation was to examine performance-related emotional experiences in highly skilled players from two soccer teams by testing the assumptions of the IZOF model. Three key issues were explored. *The first goal* of this study was to replicate the earlier IZOF-based investigations (Bortoli et al, 1997; Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b; Johnson et al, 1995; Rodazza et al, 1998) with reference to the content and intensity of emotions related to successful and unsuccessful performance. A special task was to ascertain whether and to what extent the content and intensity of emotions are different between players. Central topics were also to examine what emotions players feel prior to and during successful and unsuccessful performance, how much they feel them, and whether these emotions are helpful or harmful only at a specific level or within a wider range, as was proposed in the ZOF model ( $\pm 4$  points in the STAI scale). *The second goal* was to expand the IZOF-based research into the time dimension. Specifically, the purpose was to examine to what extent repeated assessments influence the individual content and intensity of emotion profiles. Another issue within the time dimension was to examine the temporal patterns of task-related situational emotions in four international soccer games. *The third goal* of the investigation was to replicate the preliminary studies (Syrjä, Hanin & Pesonen, 1995; Syrjä, Hanin & Tarvonen, 1995) testing the in-out of the zone principle proposed in the IZOF model. The key issue was to examine whether the principle predicts the relationship between emotion and soccer performance. The functional interpretation of the impact of emotion on performance was also re-examined (Hanin & Syrjä, 1995a).

Following these goals, the study examines four key problems: a) the content of emotions b) optimal and dysfunctional intensity zones; c) task-related situational emotion patterns; and d) the emotion-performance relationship. The following specific research questions and sub-questions were formulated.

### A. *The content of emotions*

1. What emotions do players experience prior to and during successful and unsuccessful performance?
2. To what extent is the emotion content between players similar or dissimilar?
3. What are the temporal patterns of the emotion content?
  - 3a. To what extent do players change their emotion content between repeated assessments?
  - 3b. To what extent is the emotion content between players similar or dissimilar after repeated assessments?
  - 3c. To what extent are there changes in the emotion content at the group level after repeated assessments?

According to the results of the earlier studies (Bortoli et al, 1997; Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b; Johnson et al, 1995; Rodazza et al, 1998) and the assumption of the IZOF model, the inter-individual variability in emotion content is expected to be high. In the earlier studies the level (or extent) of inter-individual variability has not, however, been specified and thus the present study extends the analysis of emotion content.

The temporal patterns of the content of emotion profiles have not been systematically studied earlier. Changes in the content of emotions are, however, expected. It is assumed that an enhanced awareness is one of the key factors which determines these changes. In other words, the players might not be very much aware of their emotions at the time of the initial assessment. However after repeated assessments they should have clearer picture of their emotions as linked to successful and unsuccessful performance. Similar results can also be expected for the optimal and dysfunctional intensity zones.

*B. Optimal and dysfunctional intensity zones*

4. What are the levels of the optimal and dysfunctional zones and to what extent are they similar or dissimilar between players?
5. To what extent do players use a wide range (several values) or a specific level (just single value) in describing their optimal and dysfunctional zones?
6. What are the temporal patterns of the optimal and dysfunctional zones?
  - 6a. To what extent do players change their optimal and dysfunctional zones between repeated assessments?
  - 6b. To what extent are optimal and dysfunctional zones similar or different between players after repeated assessments?
  - 6c. To what extent do optimal and dysfunctional zones change at the group level after repeated assessments?
  - 6d. To what extent do players use a wide range (several values) or a specific level (just single value) in describing their optimal and dysfunctional zones after repeated assessments?

It has been hypothesised that optimal and dysfunctional zones can be low, moderate, or high and vary for the same and different emotions across different athletes (Hanin 1997a; Hanin & Syrjä, 1995a, b). Initially within the ZOF model and more recently within the IZOF model, it has been further hypothesised that the optimal and dysfunctional intensity zones are a wide range rather than a specific level (Hanin, 1978, 1986; Hanin & Syrjä, 1995a, b).

*C. Task-related situational emotion patterns*

7. What are the situational emotion patterns related to soccer game-performance?
  - 7a. To what extent do players change their situational emotion intensities from pre-game through mid-game to post-game?
  - 7b. Do situational intensities vary differently between players and performance levels?

Since there is no prior research on emotion patterns in all three pre-, mid-, and post-performance situations, the assumptions are based on observations and anecdotal evidence. Because researchers hold rather consistent vision on the importance of emotions on human performing, and because a change in appraisal have been found to determine change in emotions (Lazarus 1991), it is expected that there will be variance in the intensity of emotions over time.

*D. Emotion-performance relationship*

The emotion-performance relationship was examined by testing the in-out of the zone principle proposed in the IZOF model. The principle is based on interactive effects of optimal and dysfunctional emotions. In successful performance the interactive effect is expected to be a combination of maximum enhancing effect (intensity within optimal zones) and minimum impairing effect (intensity outside dysfunctional zones), whereas in unsuccessful performance the case is the opposite. Additionally, the functional interpretation of the impact of emotion on performance was examined. Therefore, the following questions were considered.

8. What are the emotion patterns in successful, average, and poor performance?
  - 8a. When a player is successful, are his situational emotion intensities within (or close to) his optimal zones and outside his dysfunctional zones?
  - 8b. When a player is unsuccessful, are his emotion intensities outside his optimal zones and within (or close to) his dysfunctional zones?
9. What is the functional meaning of the impact of emotions for the players?

The functional interpretation of the effect of emotions on performance is assumed to be connected to the construct of energy utilization and mobilization proposed in the IZOF model.

## 5 METHODS

This study was carried out as a part of a psychological preparation program for two “generations” of the Finnish under-twenty-ones (U-21) national soccer team. For the first team the purpose was to help players prepare for the qualifying games of the Atlanta Olympics 1996, whereas the goal for the second team was to help players for the qualifying games of the World Championship Tournament in 1998. In the sections that follow, only the research relevant data and procedures will be introduced.

### 5.1 Participants

The participants of this study were 68 male soccer players from two different teams. Thirty-eight players were selected at least once for the first team, and 37 players for the second team, and 7 players were participated in both teams. The players' ages ranged between 17 and 23 years ( $M = 20.4$ ,  $SD = 1.1$ ) at the outset. Forty-seven of all the players were actively competing in the Finnish national championship league, 13 were playing in the Finnish first division, 3 in the Finnish second division, and 4 players were competing in international clubs in Holland and Sweden. At the time of the first assessment the players had participated from 0 to 55 international games (median = 15).

The data for this longitudinal study was collected before and during training or game camps lasting from 3 to 4 days. For the first team 11 camps in all were organised between March 1994 and June 1995 and for the second team 10 camps between May 1996 and October 1997. For each camp the head coach of the team selected from 12 to 25 participants (median = 17). On all occasions the coach invited the best available players on the basis of personal health status (not injured) and performance level in the national league. Each player

was selected by the coach for from 1 to 18 camps (median = 5.0), however, only one player was invited more than 12 times. In total 21 players (31 %) participated in 8 to 12 camps, 23 players (34 %) in 3 to 7, and 23 players (34 %) were selected only once or twice (Appendix 1). Although, as can be seen, the study was executed with a constantly changing composition, all the players took part to the psychological preparation program. It is also worth pointing out that the study sample comprises the most talented and skilful male soccer players of two “generations” in Finland. All available players were included.

## 5.2 Procedure and scaling methods

The data of the present study were collected along with the psychological preparation program consisting of special sessions lasting from 45 to 90 minutes. These sessions were typically organised during a game or training camps, or before the team travelled to an away match or camp. The scaling methods of the study are divided into emotion measures and performance measures. However, before describing the scaling procedures, the selection of the methods will be discussed.

### Selection of the scaling methods

*Methods measuring emotions.* Since standardised normative “ready-made” emotion scales have argued to have several methodological and conceptual shortcomings (see chapter 2.2 for a discussion), the present study concentrated on the use of the more idiographic, individually relevant, and sport- and task-specific emotion scale. This alternative is followed by the individualised emotion profiling procedure proposed within the framework of the IZOF model. The procedure is based on verbal self-reports which have been agreed to represent the only reliable tool that researchers have on the measurements of conscious, subjective emotional experiences (Barret, 1996; see chapter 2.1 for a discussion).

In the real-life context (outside the laboratory), three discrete methodological possibilities to facilitate self-reports have been introduced. For the most part emotions have been studied using current, actual, direct measures in which an athlete answers a question, such as, “How do you feel right now?” Current measures are considered a simple and practical method involving no concern about memory decay or possible attribution effects (Gould & Tuffey, 1996). However, several limitations regarding the use of current assessments in a top-level sport setting, has been pointed out including, for example, distraction for a performer and the difficulties in measuring emotions during the activity (see Hanin, 1997b, for a further discussions). To avoid these limitations, focused recalls (e.g. “How did you feel just before the game started?”) and anticipated (e.g. “How do you think you will feel just before the game starts?”) measures have been proposed (e.g. Hanin, 1986, 1995a, 1997b). The anticipated and recalled measures give for researchers a possibility to



study emotional experiences just before and during a competition without any distraction to the performer (Hanin 1995c, 1997b). The use of focused recalls was initially proposed for identifying individual optimal anxiety levels (e.g. Hanin, 1978, 1986, 1989), while anticipated measures have typically been used in studies testing how well athletes are able to predict their emotions before a forthcoming competition (see Jokela & Hanin, 1997, for a meta-analysis).

Hence, in the present study performance-related conscious emotional experiences were measured by using the individualised emotion profiling procedure, which is based on introspective self-reports. All the three proposed measurement procedures - anticipated, current, and recalled - were utilised. The identifications of optimal and dysfunctional emotion profiles were executed using focused recalls of players' past performance history. Focused recalls were also used in task-related situational emotion measurements along with current and anticipated assessments.

*Methods measuring performance.* Researchers have introduced several ways of evaluating the outcomes of athletic performance, including either objective or subjective measures, relative or absolute scores, and / or focusing on performance outcome or process. The advantages and disadvantages of these measuring techniques are documented in several reviews (e.g. Gould & Krane, 1992; Gould & Tuffey, 1996; Hanin, 1997a; Raglin, 1992; Weinberg, 1990). As mentioned earlier (chapter 2.2), the major drawback in previous emotion-performance studies have been the use of outcome measures as the operational definition of performance. As such this procedure is not appropriate in contact team sport such as soccer either. And since performance profiling (Butler & Hardy, 1992; Doyle & Parfitt, 1996; Jones, 1995b) has been limited to individual sports, there are only two possibilities - objective or subjective - to measure the performance of individual soccer players.

For soccer performance, a few possible objective measuring procedures have been proposed (Krane, 1993; Rodrigo et al, 1990). Rodrigo and his colleagues used objective performance measures consisting of two components of soccer performance: number of passes and the ability to play the position. Krane (1993) used a systematic observation method that subdivided soccer into component skills. This objective measure centred upon passing, loss of possession, fouls, heading, shooting, assists, and goals. However, both of these procedures are limited to a very narrow range of total soccer performance. For instance, the skill of opponent, which is central for evaluating performance in contact team sports, was not taken into consideration in these procedures.

Subjective self-rating is another possibility. In fact, Raglin (1992) considers subjective ratings as the only practical alternative in the case of team contact sports. The advantages of the subjective measures are considered to be the possibility to measure such performance-related variables as general health, training or condition status (e.g. Gould et al, 1993; Raglin, 1992), which can not be taken into account with objective measures. Possible attribution and bias effects have been reported to be the disadvantages of subjective evaluation. Nonetheless, in the present study, subjective self-rated performance measures were used.

### Emotion measures in the study

The data on players' emotional experiences was divided into three parts consisting of the measurements of a) individualised emotion profiles, which were developed using focused recalls of one's past experiences playing soccer, b) situational task-related emotion intensities, which were conducted using anticipated, current and recalled assessments before and after four international games, and c) open-ended questions.

*Individualised emotion profiling procedure.* Performance-related emotional experiences were measured using the individualised emotion profiling procedure. The procedure, introduced within the framework of the IZOF model, consists of a stimulus list of emotion descriptions which has been developed by Hanin (see Hanin, 1993, 1994, 1997a, b; Hanin & Syrjä 1995a for a discussion). The stimulus list was constructed using the adjectives of ten existing Positive and Negative Affect (PNA) Scales described by Watson and Tellegen (1985). First, Hanin selected the most appropriate words for describing emotions in sports. The emotion descriptions were then dichotomised into positive, pleasant and negative, unpleasant adjectives and a translation into Finnish was done, resulting in a total of 40 positive and 37 negative words. Finally, the adjectives were classified into groups of meaningfully similar emotions, such as "confident", "certain", and "sure" or "tired", "weary", "exhausted", and "worn-out". Hence, both the positive and negative lists include 15 groups of words (Finnish version in Appendix 2, see also Appendix 17 for the English translation of the words).

The stimulus list of emotion descriptions was utilised in the identification of the performance-related emotion content. This was done by asking each player to recall his past experience playing soccer and to select from the stimulus list (or add his own words) four to five:

- a) positive adjectives which best describes his emotions either prior to or during (or both) a typical successful performance (P+),
- b) negative adjectives which best describes his emotions either prior to or during (or both) a typical successful performance (N+),
- c) positive adjectives which best describes his emotions either prior to or during (or both) a typical unsuccessful performance (P-), and
- d) negative adjectives which best describes his emotions either prior to or during (or both) a typical unsuccessful performance (N-).

If the task was found difficult, the players were instructed to select as many words as they could for each emotion category. The players were asked to write the adjectives on a special emotion scale form (see Appendix 3).

After the individually relevant emotion descriptions were selected, the players were requested to identify a typical level of intensity in successful and unsuccessful performance. Intensity of emotions was measured by modified Borg's (1982) category scale (CR-10 scale), which consists of ratio properties for intermodal and inter-individual comparisons. The CR-10 scale has been shown to be a practical and valid instrument for psychophysical estimations such as an exercise capacity, exertion, or pain at the individual level (see Neely, Ljunggren,

Sylvén & Borg 1992). According to Borg (1992), the scale has been constructed to avoid a ceiling effect, and thus should be applicable in many kinds of situations where estimates of subjective intensities are needed (see also Hanin & Syrjä, 1995a, for a discussion). In the present study the scale was utilised with the following verbal anchors (Finnish versions in the brackets; see also Appendix 3: left-hand column):

- 0 – nothing at all (ei yhtään)
- 0.5 – very, very little (erittäin vähän)
- 1 – very little (melko vähän)
- 2 – little (vähän)
- 3 – somewhat (kohtuullisesti)
- 4 – moderately (keskimääräisesti)
- 5 – much (paljon)
- 6 –
- 7 – very much (hyvin paljon)
- 8 –
- 9 –
- 10 – very, very much (erittäin paljon)
- # – maximal possible (maksimaalinen)

These verbal anchors have been modified by Hanin (Hanin & Syrjä 1995a) from the original CR-10 scale anchors for the estimation of emotion intensities. Using Borg's scale and the verbal anchors, the players were asked to identify:

- a) for each helpful positive and negative emotion, the optimal zone indicating the level of intensity in a typical successful performance; and
- b) for each harmful positive and negative emotion, the dysfunctional zone indicating the level of intensity in a typical unsuccessful performance.

The players were further instructed to describe these typical zone levels by using either a single value (a specific level) or several (at least 2) values (a wider range) according to what they thought most appropriate for a given emotion.

As an example, two players' (P1 and P2) emotion profiles related to typical successful and unsuccessful performances are presented in Table 2 and Table 3.

TABLE 2 Emotion profile related to typical successful and unsuccessful performance for *player 1*

| Successful performance                  |                 | Unsuccessful performance                |                       |
|---|-----------------|---|-----------------------|
| Emotion category<br>Emotion description | Optimal<br>zone | Emotion category<br>Emotion description | Dysfunctional<br>zone |
| Positive (P+)                           |                 | Positive (P-)                           |                       |
| energetic (energinen)                   | 7               | overjoyed (iki-ihastunut)               | 1                     |
| willing (halukas)                       | 7               | agreeable (miellyttävä)                 | 1                     |
| alert (pirteä)                          | 5               | relaxed (rentoutunut)                   | 3                     |
| reactive (sähäkkä)                      | 7               | composed (tyyni)                        | 2                     |
|   |                 | satisfied (tyytyväinen)                 | 3                     |
| Negative (N+)                           |                 | Negative (N-)                           |                       |
| nervous (hermostunut)                   | 2               | distressed (ahdistunut)                 | 2                     |
| aggressive (hyökkäävä)                  | 4               | lazy (laiska)                           | 8                     |
| tense (jännittynyt)                     | 4               | dispirited (apea)                       | 1                     |
| passionate (kiihkeä)                    | 2               | sad (surullinen)                        | 3                     |
| afraid (pelokas)                        | 3               | tired (väsynyt)                         | 8                     |

TABLE 3 Emotion profile related to typical successful and unsuccessful performance for *player 2*

| Successful performance                  |                 | Unsuccessful performance                |                       |
|---|-----------------|---|-----------------------|
| Emotion category<br>Emotion description | Optimal<br>zone | Emotion category<br>Emotion description | Dysfunctional<br>zone |
| Positive (P+)                           |                 | Positive (P-)                           |                       |
| energetic (energinen)                   | 5-10            | carefree (huoleton)                     | 7-10                  |
| peaceful (rauhallinen)                  | 7-10            | animated (vilkas)                       | 7-10                  |
| confident (luottavainen)                | 7-10            | fearless (peloton)                      | 9-10                  |
| fearless (peloton)                      | 4-5             |   |                       |
| brisk (rivakka)                         | 5-7             |   |                       |
| Negative (N+)                           |                 | Negative (N-)                           |                       |
| passionate (kiihkeä)                    | 2-4             | uncertain (epävarma)                    | 5-10                  |
| tense (jännittynyt)                     | 1-3             | unwilling (haluton)                     | 7-10                  |
| dissatisfied (tyytymätön)               | 5-7             | tired (väsynyt)                         | 5-10                  |
|   |                 | restless (levoton)                      | 5-10                  |
|   |                 | afraid (pelokas)                        | 7-10                  |

An emotion profile was initially collected from 64 players out of the total of 68 (37 players were from the first team and 27 players from the second team). However, two players' emotion profiles were not included in the data analyses because the profiles were constructed erroneously. Twenty-four players from the first team further participated in the repeated assessments by constructing their second emotion profile, and 11 players also developed their third emotion profile.

Exact time intervals and a number of task-related situational emotion measurements (see next section) between the first and second, and between the second and third assessments are presented for each player separately in Table 4 (see also Appendix 1).

TABLE 4 The time intervals (days) and a number of task-related emotion measurements between the first, second, and third emotion profile assessments

| Player | Between 1 <sup>st</sup> and 2 <sup>nd</sup> assessments |                               | Between 2 <sup>nd</sup> and 3 <sup>rd</sup> assessments |                               |
|--------|---|-------------------------------|---|-------------------------------|
|        | N of days   | N of situational measurements | N of days   | N of situational measurements |
| 2      | 79  | - <sup>1)</sup>               | 168   | 7                             |
| 3      | 79  | -                             | 168   | 21                            |
| 4      | 79  | -                             | 168   | 10                            |
| 5      | 79  | -                             | 209   | 13                            |
| 6      | 79  | -                             | 168   | 9                             |
| 8      | 79  | -                             | 209   | 9                             |
| 9      | 79  | -                             | 168   | 19                            |
| 10     | 79  | -                             | 168   | 21                            |
| 11     | 79  | -                             |   |                               |
| 12     | 79  | -                             | 168   | 21                            |
| 14     | 217   | 14                            |   |                               |
| 16     | 79  | -                             |   |                               |
| 17     | 79  | -                             | 168   | 26                            |
| 19     | 217   | 2                             |   |                               |
| 20     | 79  | -                             |   |                               |
| 21     | 79  | -                             |   |                               |
| 22     | 79  | -                             |   |                               |
| 23     | 79  | -                             |   |                               |
| 24     | 79  | -                             | 168   | 16                            |
| 26     | 168   | 16                            |   |                               |
| 27     | 209   | 16                            |   |                               |
| 28     | 90  | 9                             |   |                               |
| 29     | 161   | 4                             |   |                               |
| 30     | 42  | -                             |   |                               |

<sup>1)</sup> Task-related emotion measurements were not conducted

Note. Task-related situational emotion measurements were conducted in seven situations in each game.

As Table 4 shows, for the most of the players (67 %) the time interval between the first and second emotion profile assessments was 79 days (ranging from 42 to 217). Between the second and third assessments the time interval was for 9 players 168 days, and for 2 players 209 days. The task-related emotion measurements were not gathered between the first and second emotion profiles for the most of the players; six players, however, had from 2 to 19 measurements. From the second to third emotion profile the players had from 7 to 26 task-related emotion measurements. It is worth pointing out that most of the players had no task-related measurements between the first and second emotion profiles for two reasons. First, the purpose was to avoid the longer

time-interval between the repeated emotion profile assessment. Second, the players started their task-related measurements during the second camp, and it was assumed that by constructing the second emotion profile the players would supply more accurate adjectives and zones for the measurements.

The emotion profiles were used in the analysis of the emotion content (research questions 1 to 3) and optimal and dysfunctional zones (research questions 4 to 6). The emotion profiles were also utilised in the examinations testing the in-out of the zone principle (question 8).

*Task-related situational emotion measures.* Task-related emotion measurements were conducted before and after four international home games during the season 1994 - 1995 (team 1). The first game was a friendly match against England, which ended in a 2 - nil victory for Finland. The second game, also a friendly match, was played against Sweden, who won the game 4 - 1. The third and fourth games were qualification matches for the Atlanta Olympics 1996. Finland won both of matches, first, against Scotland, 1 - nil and then, against San Marino, 4 - nil. The games were all played in the late afternoon or evening.

The measurements were obtained from 22 players who participated in the games either full-time or as substitutes (Appendix 4). For those players who had more than one emotion profile, the most recent version was always used. The content (a list of adjectives) of each player's emotion profile served as the individual emotion scale for the anticipated, current and recalled measurements before and after the matches. The during-game activity was divided into four parts in order to indicate more accurately the emotional states in soccer as a long-duration sport.

Using Borg's scale each player was asked to subjectively evaluate his situational emotion intensities. For this purpose a special form was used (see Appendix 3 for the Finnish version). The following specific questions were asked.

- 1) How do you feel right now (current)?
- 2) How do you think you will feel just before the forthcoming game (anticipated)?

These two questions were asked approximately one day before (24 hours) the forthcoming game. The following questions took place about 30 minutes after the game.

- 3) How did you feel during the first part of the first half (recalled)?
- 4) How did you feel during the second part of the first half (recalled)?
- 5) How did you feel during the first part of the second half (recalled)?
- 6) How did you feel during the second part of the second half (recalled)?
- 7) How do you feel right now (current)?

All the players (n = 14) who had measurements in all seven situations in at least one game were included in the analyses of the task-related situational emotion patterns (research question 7). For the analysis testing the in-out of the zone principle all the players (n = 22) were used (question 8).

*Open-ended questions.* The open-ended questions were administered to 17 players (all members of the second team) after they had developed the

individual emotion profile. The players were instructed to write their emotion descriptions on a special form (see Appendix 5 for the Finnish version) and were then asked to indicate verbally their interpretation of them, as follows:

- a) "Why and how are these optimal emotions helpful to you?"
- b) "Why and how are these dysfunctional emotions harmful to you?"

Each emotion description was interpreted separately. Similar procedure has been used in one preliminary study (Hanin & Syrjä, 1995a). The open-ended questions were used to explore the last research question (9).

### **Performance measure in the study**

In the present study, performance was measured using a subjective self-rating procedure. Performance measures were collected using modified Borg's (1992) CR-10 scale with the following anchors (Finnish versions in brackets): 0.5 - extremely poor (erittäin huono); 1 - very poor (hyvin huono), 2 - poor (huono); 3 - below average (alle keskitason); 4 - average (keskinkertainen); 5 - above average (yli keskitason); 7 - very successful (oikein hyvä), 10 - extremely successful (erittäin hyvä); # - excellent (loistava); for values 0, 6, 8, and 9 the anchors were not used (see the Finnish version in Appendix 3, bottom section).

In one earlier study (Syrjä, Hanin & Pesonen, 1995), a similar procedure was used among soccer players. However, in the investigation by Syrjä et al the players were asked to recall their performance level taking the game as a whole into consideration. In soccer, as a long duration sport, it is likely that the level of performance will change during a match. Therefore, in the present study the during-game activity was divided into four parts, and then, each part was assessed separately (partial performance ratios) and together (total performance ratio).

All 22 players who executed the emotion measurement 30 minutes after the four international games and who participated in the matches either full-time or as a substitute, were asked to self-rate their performance (Appendix 6). However, despite participating in the game, one player (P 14) did not self-rate his performance using the four during-game parts. The following specific questions were asked approximately 30 minutes after the four home games:

- a) What was your performance level concerning the whole game (total performance ratio)?
- b) What was your performance level concerning the first part of the first half (first quarter performance ratio)?
- c) What was your performance level concerning the second part of the first half (second quarter performance ratio)?
- d) What was your performance level concerning the first part of the second half (third quarter performance ratio)?
- e) What was your performance level concerning the second part of the second half (fourth quarter performance ratio)?

These self-related performance measures were utilised in the analyses testing the in-out of the zone principle (question 8) and task-related situational emotion patterns (question 7b). As a summary of the data collection, Appendix 7 presents the player samples to each of the four research problems.

### 5.3 The validity and reliability of the emotion and performance measurements

*Reliability of the measurement.* The reliability of emotion measurements regarding the identification of individual emotion profiles can be tentatively tested by investigating the test-retest difference. This difference, indicating the reproduce ability or stability of emotion profiles, was analysed in the present study by examining at the intraindividual level the extent of changes in the emotion content and intensity zones between repeated assessments. However, high stability does not necessary reflect high reliability; in fact it could also reflect low reliability. Changes in the emotion content and intensity zones (instability) reflect that motivation by the players to develop an emotion profile which best describes their feelings in successful and unsuccessful performance. On the contrary, if the emotion profiles remain similar regardless of repeated assessments, it might reflect a lack of motivation by the players to develop a scale for them. These issues make it very difficult to indicate the exact reliability rates for measurements of emotion profiles.

Another criterion, more clearly indicating the reliability of emotion measurements when emotions are considered as state rather than trait, is the level of internal consistency. In the present study, the internal consistency was analysed with Cronbach's alpha-coefficients. The alphas were calculated using the predicted, current, and recalled task-related emotion intensity measurements for each player ( $n = 22$ ) and for each individual emotion scale separately (Table 5). The results showed that the intraindividual alpha-coefficients ranged from 0.64 to 0.99 ( $M = 0.90$ ;  $SD = 0.09$ ). The findings indicate that the internal consistency of the task-related measurements is high.

TABLE 5 The intraindividual Cronbach's alpha-coefficients for the predicted, current, and recalled task-related emotion intensity measurements on each emotion scale ( $n = 22$ )

| Cronbach's alpha | Emotion scale used in the task-related measurements |                              |                            |
|------------------|---|------------------------------|----------------------------|
|                  | First scale<br>( $n = 7$ ) <sup>a</sup>             | Second scale<br>( $n = 18$ ) | Third scale<br>( $n = 8$ ) |
| Mean             | 0.90  | 0.92                         | 0.85                       |
| SD               | 0.10  | 0.05                         | 0.14                       |
| Min              | 0.68  | 0.83                         | 0.64                       |
| Max              | 0.96  | 0.98                         | 0.99                       |

<sup>a</sup> Number of players using the first, second or third personal emotion scale in the task-related measurements.

Note. See also Appendix 4.



*Validity of the measurement.* According to Hackfort and Schwenkmezger (1993, p. 340), the validity of verbal self-reports “depends significantly on such factors as openness, honesty, accurate self-evaluation, and the self-awareness of the respondent”. These arguments are relevant to all the measurements, i.e. the identification of the emotion profiles, task-related emotion measurements, open-ended questions, and self-rated performance measures. To avoid this problem with openness and honesty, the participants of the present study were assured that the psychological preparation program, including the emotion and performance measurements, was meant only to help improve their performance, not, for instance, to assist the coach in making decisions. It should be also noted, that the present participants were highly motivated, talented, and skilled soccer players who have good prospects to play and earn money in the best professional clubs in the Europe or elsewhere in future. In addition, feedback from the players indicated that their attitude and motivation to execute the emotion and performance measurements was high.

Furthermore, the longitudinal study design with several repeated assessments enables players to increase their awareness of optimal and dysfunctional emotion descriptors and emotion intensities. By measuring, monitoring, and describing emotions, athletes are assumed to become more aware of their own effective and ineffective emotional experiences related to performance. This assumption is supported by anecdotes gathered in the course of the psychological preparation program, which indicate that until the program started many players did not have a tool for the active use of emotions in preparation for or during an activity, and thus emotions were usually ignored. After carrying out the program, players reported having more systematic preparation routines, which usually result in effective emotional states to start a task. The psychological preparation program, therefore, seems to increase the validity of the measurements.

Another crucial aspect for the validity of the measurements is the accuracy of predicted and recalled assessments. This issue has been examined in number of cross-cultural anxiety-based investigations with supportive and consistent results; see Annesi (1997) for a review or meta-analysis (Jokela & Hanin, 1997). These studies have clearly shown that athletes are able to predict and recall their emotions hours, days, or even weeks before and after a competition. A similar observation was also made in one particular study which examined the accuracy of these measures using the individualised emotion profiling procedure (Hanin & Syrjä, 1996). One day (about 24 hours) before an international match 17 male Olympic-level soccer players (all participants in the present study) were requested to anticipate their feelings about the situation 40 minutes before the game. Later on during the following day, 40 minutes before the match, the players were asked to measure their current emotion level. Then 30 minutes after the match, the players were request to recall their emotions 40 minutes before the game. At the individual level, a systemic modification of the Sign test (SMST) indicated a significant correspondence ( $p < .05$ ) in 71 % of cases between anticipated and current and in 77 % of cases between recalled and current emotion scores. These results provide support for the validity of these measurements.

A critical issue, which could have an influence on task-related performance measures, is the notion that a special strategy for many coaches in team sports is within-team competition. Therefore, in team sports a relevant element of the coaching environment is to create a hard competitive atmosphere, for instance, in selections of starting lines, game positions, or the amount of playing time. This competitive atmosphere might have consequences for the emotional interpretations measured, especially before a forthcoming game. The willingness to succeed in a forthcoming game might also have an influence on players' subjective interpretation in rating their situational feelings. In other words, a player's subjective interpretation might be affected by a question of "How much he should feel an emotion in order to play successfully in the forthcoming game?" These two issues may only have an influence on measurements gathered 24 hours before the forthcoming game (right now, 24 hours before, and prediction for just before). On the other hand, the post-game (30 minutes after) measurements (recalled and current) might be influenced by the feelings of winning, losing, or tiredness. However, with the participants of the present study, who represented a group of highly skilled and motivated top athletes, it is assumed that these issues would not have so much influence that they would decrease the validity of the measurements.

It is also noteworthy that the face validity of the content of emotion scales can be assumed to be high, since the individualised emotion profiling procedure is being used (Hanin et al, 1998; Syrjä & Hanin, 1997). It is assumed that all the most individually relevant emotion descriptions indicating each player's unique emotional experiences in relation to performance are listed in the individual emotion profile. This issue will be elaborated in the general discussion (see chapter 7.1).

The validity of the measurements using Borg's scale is dependent on several tentative issues. First, if the players do not have earlier experience of using the scale, they might experience difficulties in accurately measuring or identifying their emotion intensities and performance. However, regards to the present study with its longitudinal perspective, the learning effect caused by repeated assessments are considered to increase the validity of the assessments. A second issue is the personal way of using the instrument (systematic error). Despite the verbal anchors, for instance, the average intensity level or performance could reflect different states for different individuals. Due to the low number of repeated assessments, this possible error was not taken into account in the data analysis of the present study (by using e.g. Z-points), and thus the inter-individual and group level analysis should be considered with this limitation in mind.

## **5.4 Data analysis and statistical methods**

At the intraindividual level, the analyses were carried out using all the adjectives listed in the individual emotion profiles. The words were explored within (or between) a) single adjectives in each emotion category (P+, N+, P-,

and N-), b) joint adjectives in optimal (P+N+) and dysfunctional (P-N-) categories, or c) the total emotion list (P+N+P-N-). In most cases the examinations at the inter-individual and group level were done using the emotion categories as an observation (variable). Certain data transformations were used for the data analysis.

*The content of emotions.* In the Hanin's stimulus list of emotion descriptions, the adjective "jännittynyt" (tense) was included in both the positive and negative lists (see Appendix 2). The meaning of the Finnish word "jännittynyt" is quite close to emotion anxiety and because of the confusion in the interchangeable use of this concept (anxiety - anxious) in the literature, Hanin decided to include the term in the both lists. However, the meaning of the word "jännittynyt" in Finnish is negative. Thus, to avoid the confusion and to follow the logical procedure of dividing emotion into positive and negative, the term "jännittynyt" in the present study was only located on the negative list. As a consequence of this modification, the term "jännittynyt", selected by 21 players as positive optimal or dysfunctional emotion, was moved into the negative categories in 14 cases (5 to N+ and 9 to N-), and rejected in 17 cases where the word had already been selected for the functionally similar negative category.

Comparisons of emotion content (a list of adjectives) were done by calculating the amount of overlap scores, as proposed by Krahe (1986) for testing the amount of similarity between two different qualitative lists. Krahe used this calculation in her study of individual perceptions of situations. In the sport setting, the procedure has recently been utilised in the existing studies (e.g. Hanin, Jokela & Syrjä, 1998; Hanin & Syrjä, 1997).

In the present study, the inter- and intraindividual and within-group similarity of the emotion lists was analysed by computing the overlap scores using the following formula:

$$\text{overlap (ij)} = \text{NC (ij)} / \sqrt{N (i) \times N (j)}$$

where: NC (ij) = number of shared (similar) words for condition i and j; N (i) = number of words for condition i; and N (j) = number of words for condition j. The overlap scores can rank from 0 (all words are different) to 1 (all words are similar). Conceptually, the overlap scores represents how similar the emotion lists developed by individual players are in condition i and j.

*Optimal and dysfunctional intensity zones.* Several data transformations were performed for the analysis of the optimal and dysfunctional intensity zones. First, if the maximum possible (#) score was used by a player, it was transformed to 10. Second, for the comparisons, all the intensity zones which were described by players using at least two figures, were transformed to a median level of intensity (zone medians). For example, if a player defined his zone as 3 to 5, the median level would be 4, or if a player used 2 to 3 scores, it was transformed to 2.5. The median was used, instead of the mean, because Borg's scale is a ratio scale with an unequal distribution (see chapter 5.2). This modification concerns also performance ratios.

*Task-related situational emotion patterns.* At the intraindividual level, the analysis of the task-related emotion patterns was executed by using all the adjectives listed on the individual emotion scale. At the group level, emotion patterns were analysed using each player's combined levels (medians) of situational intensities for each emotion category. The following parameters were calculated and used:

- a) m P+ = median of task-related intensities of positive optimal emotions;
- b) m N+ = median of task-related intensities of negative optimal emotions;
- c) m P- = median of task-related intensities of positive dysfunctional emotions;
- d) m N- = median of task-related intensities of negative dysfunctional emotions;
- e) m P+N+ = median of task-related intensities of all optimal emotions;
- f) m P-N- = median of task-related intensities of all dysfunctional emotions; and
- g) m P+N+P-N- = median of task-related intensities of all emotions.

*In-out of the zone principle.* The in-out of the zone principle was tested using a separate and joint effect of optimal and dysfunctional emotions. A similar procedure has been used in an earlier study (Syrjä, Hanin & Tarvonen, 1995). The principle was examined by calculating the absolute deviations of a player's predicted, current, and recalled situational emotion intensities from his optimal and dysfunctional zones. This calculation was first performed for all single adjectives. Then, the deviations were combined within each emotion category using the following parameters:

- a) d P+ = mean of absolute deviations of positive optimal emotions;
- b) d N+ = mean of absolute deviations of negative optimal emotions;
- c) d P- = mean of absolute deviations of positive dysfunctional emotions;
- d) d N- = mean of absolute deviations of negative dysfunctional emotions;
- e) d P+N+ = mean of absolute deviations of all optimal emotions; and
- f) d P+N- = mean of absolute deviations of all dysfunctional emotions.

Finally, the combined parameters for each emotion category were used to examine the joint effect of optimal and dysfunctional emotions. This was done by subtracting the optimal emotion deviations from the dysfunctional emotion deviations according to the following formula:

$$g) d (P+N+P-N-) = [(d(P-) + d(N-)) - [d(P+) + d(N+)].$$

Thus, the bigger the value the better should be the performance.

*Non-parametric statistical tests.* Siegel and Castellan (1988, p. 34) argued that non-parametric statistics should play an important role in the behavioural and social sciences, because in these fields scientists rarely have data satisfying the assumptions of parametric tests. The present study is no exception to Siegel and Castellan's arguments with respect to e.g. the relatively low sample size and the individualised scales. Thus, the statistical methods of the present study were focused on the use of non-parametric tests only.

The intraindividual and within-group comparisons were performed using either the Sign test, Friedman Two-Way Analysis of Variance by Ranks, or Spearman Rank-Order Correlation Coefficient ( $r_s$ ). The Sign test was used for comparisons of the difference between two related samples on one specific variable. The test focuses on the direction of the difference, and if a matched-pair shows no difference, it is dropped from the analysis. The Friedman test was utilised in the analysis of more than two related samples of one variable. According to Siegel and Castellan, the test is appropriate when the measurements of the variable are at least ordinal. The ratio scale with increasing scores used in the present study meets the condition of the Friedman's test. The Friedman test has also the advantage of exact probabilities for very small samples. If the test indicates significant results, it means that at least one pair of conditions has different medians. The correlation of the two related samples on one variable was calculated using the Spearman Rank-Order Correlation Coefficient ( $r_s$ ).

The inter-individual and inter-group comparisons were examined using either the Mann-Whitney Test or a Kruskal-Wallis One-Way Analysis of Variance by Ranks. The Mann-Whitney test was used in contrasting two independent samples on one variable. The test has found to be one of the most powerful of the non-parametric tests (see Siegel & Castellan, 1988, for a discussion). The Kruskal-Wallis test was utilised for the comparisons of three independent samples on one variable. If the test indicates significant results, it means that at least one pair of groups has different medians.

As a summary, Appendix 8 presents an overview on all the variables used in the present study.

## 6 RESULTS

The study was classified into four key research problems: the content of emotions; optimal and dysfunctional zones; task-related situational emotion patterns; and the emotion-performance relationship. All these problems will be examined separately and followed by a brief summary and interpretation of the findings.

The research hypotheses were examined by using intraindividual, inter-individual, within or inter-group comparisons. In the intraindividual examinations, each player's data were used as a sample, whereas in the inter-individual analysis the data were contrasted between different players. At the group level, the comparisons were executed either within the whole sample or between different groups.

The emotions in the text were translated from Finnish to English. However, in the tables both English and Finnish words are presented to avoid semantic problems due to the translation (see also Appendix 17).

### 6.1 The content of emotions

Following the individualised emotion profiling procedure, the players were asked to identify 4 to 5 positive and 4 to 5 negative emotion descriptions which best describe their feelings relating to successful and unsuccessful performance. The patterns of the 62 players' initial emotion content will be analysed first. Then, by using the repeated measurements, the temporal effect on the emotion content will be examined in the 24 players who were asked to develop another emotion profile several months after from the initial assessment, and in the 11

players who were again after an interval from the second measurement were once again requested to develop their third emotion profile.

### **6.1.1 The patterns of emotion content: Initial assessment**

The aim of the following analysis was to identify what emotion descriptions players reported experiencing prior to and during typical successful and unsuccessful performance. Using the initial assessments, emotion content was explored at the intraindividual, inter-individual, and within-group levels.

#### **Intraindividual comparisons**

As typical examples, Table 2 and Table 3 (see p. 46) present two players' emotion descriptions in each of the four emotion categories. The individual-generated emotion profiles contained from 5 to 21 adjectives ( $M = 15.0$ ,  $SD = 3.1$ ). In a typical case the players listed 5 words for the P+ category, 4 words for the N- category, and 3 words for the P- and N+ categories. Of the 62 players 5 (8 %) did not select any positive dysfunctional emotions (P-), and only 4 players (6 %) used their own words, from outside the stimulus list, to describe their emotions. These findings provide support for the four emotion categories proposed in the IZOF model. However, the results indicate that for the players it was easier to identify their positive optimal (P+) and negative dysfunctional (N-) emotions than their negative optimal (N+) and positive dysfunctional (P-) emotions. Better awareness of the P+ and N- emotions could be one reason for this notion. Another reason could be the tradition of thinking of positive emotions as useful and negative emotions as harmful for performance. Therefore, the task of describing negative optimal and / or positive dysfunctional emotions could run counter to common sense.

It is also notable that 15 % of the players selected a similar emotion for both the optimal and dysfunctional categories (either P+ and P-, or N+ and N-). In total 9 such emotion descriptions were observed including "distressed", "aggressive", "tense" (2 times), "intense", "afraid", "fearless", and "dissatisfied" (2 times). This finding reflects the fact that for some players at least several emotions can have both helpful and harmful impacts on performance.

#### **Inter-individual comparisons**

Each player's emotion list was contrasted with the other players' lists and similarity in adjectives was analysed by counting the amount of content overlap. The players ( $n = 5$ ) who did not select any words for the P- category were not included in the comparison. Identical emotion lists between the matched-pairs were not observed in the P+, P+N+, P-N-, and P+N+P-N- categories, although in each of the N+, P- and N- emotion categories, one such list (matched-pair) was observed. On the contrary, all the emotion descriptors listed in the P+ category were found to be completely dissimilar for 25 % of all the matched-pairs, in the N+ category for 28 %, in the P- category for 57 %, and

in the N- category for 38 % of the pairs. The average of the inter-individual content overlap scores was found to be 0.23 for the total emotion list (P+N+P-N-) (Table 6). As expected, the results indicate that emotion lists with players' own descriptors indicating their individually relevant emotions, are highly dissimilar between players, although for only 2 % of all the matched-pairs were the total emotion lists found to be completely dissimilar. The findings support the assumption of the IZOF model regarding the high inter-individual variability in emotion content.

TABLE 6 The mean, standard deviation (SD) and range of the inter-individual overlap scores in emotion content (n = 57)

| Overlap score | Emotion content |      |      |      |      |      |          |
|---------------|-----------------|------|------|------|------|------|----------|
|               | P+              | N+   | P-   | N-   | P+N+ | P-N- | P+N+P-N- |
| Mean          | 0.25            | 0.30 | 0.17 | 0.20 | 0.27 | 0.19 | 0.23     |
| SD            | 0.19            | 0.23 | 0.21 | 0.19 | 0.15 | 0.14 | 0.11     |
| Range         | 0.89            | 1.00 | 1.00 | 1.00 | 0.76 | 0.75 | 0.60     |

Note. The amount of overlap shows the similarity between two lists of emotions. Overlap scores can range from 0 (totally dissimilar) to 1 (totally similar)

### Within-group comparisons

Descriptive findings of the frequencies for each positive (P+ and P-) and negative (N+ and N-) adjective across the whole sample are reported in Appendix 9. For the individual emotion profiles 62 players selected altogether 930 emotion descriptions consisting of 461 positive and 469 negative adjectives. However, only 44 positive and 38 negative different words were used including 6 positive and 2 negative own words. Only two adjectives, "light-hearted" and "strained", from the stimulus list were never selected. Consequently, each selected positive optimal emotion description was used by 1 to 29 players (median = 4), negative optimal by 1 to 39 players (4), positive dysfunctional by 1 to 25 players (2), and negative dysfunctional by 1 to 28 players (6). These findings provide support for the use of the idiographic scaling procedure.

Consistent with earlier findings (Hanin, 1997a; Hanin & Syrjä, 1995a, b), these results reflect that there are at least three types of emotions: core emotions reflecting the demands of the sport and / or task, idiosyncratic emotions indicating individual characteristics, and irrelevant emotions for the task (never selected). As seen from Appendix 9, the core positive emotion descriptions (the most frequently selected in both categories) were "carefree", which was chosen by 52 % of players, then "energetic" (50), "charged" (44), "confident" (44), "motivated" (34), and "satisfied" (34). In the case of negative emotion descriptions, the mostly frequently used words were "tense" (76 %), "dissatisfied" (69), "tired" (45), "aggressive" (40), and "uncertain" (40). These adjectives are the most appropriate to describe emotions related to soccer performance at the group level. In addition, the top-ten emotion descriptions



and their frequencies in the different emotion categories are reported in Table 7. As the table shows, only 2 words, “dissatisfied” and “certain”, were observed to be in both the optimal and dysfunctional lists, while the rest of the emotion descriptions were observed in only one category. This result indicates that the typical emotions that the players feel prior to and during successful performance are different than those that are experienced prior to or during unsuccessful performance. The findings also provide support for classifying emotions into four categories, and indicate that these categories should be central if the purpose is to develop an aggregate sport-specific emotion scale (see chapter 7 for a discussion). It is also notable that the emotions (e.g. anxiety, anger, self-confident, and flow), which have been extensively studied in the sport settings (see chapter 2.3), are reflected in these lists by closely related adjectives such as “tense”, “aggressive”, and “confident”.

TABLE 7 The frequencies (%) of the top-ten emotion descriptors for the optimal (P+ and N+) and dysfunctional (P- and N-) emotion categories (n = 62)

| Optimal emotions            |                  | Dysfunctional emotions    |                  |
|-----------------------------|------------------|---------------------------|------------------|
| Emotion category            |                  | Emotion category          |                  |
| Emotion descriptions        | N of players (%) | Emotion descriptions      | N of players (%) |
| <b>Positive (P+)</b>        |                  | <b>Positive (P-)</b>      |                  |
| energetic (energinen)       | 47               | carefree (huoleton)       | 40               |
| charged (latautunut)        | 44               | satisfied (tyytyväinen)   | 29               |
| confident (luottavainen)    | 40               | tranquil (tyyni)          | 21               |
| motivated (motivoitunut)    | 34               | at ease (mukava)          | 21               |
| willing (halukas)           | 29               | animated (vilkas)         | 16               |
| reactive (sähkö)            | 26               | overjoyed (hurmioitunut)  | 15               |
| rested (levännyt)           | 23               | fearless (peloton)        | 13               |
| determined (määrätietoinen) | 21               | nice (kiva)               | 13               |
| brave (rohkea)              | 19               | certain (varma)           | 11               |
| certain (varma)             | 19               | agreeable (miellyttävä)   | 11               |
| <b>Negative (N+)</b>        |                  | <b>Negative (N-)</b>      |                  |
| tense (jännittynyt)         | 63               | tired (väsynyt)           | 45               |
| dissatisfied (tyytymätön)   | 52               | unwilling (haluton)       | 37               |
| aggressive (hyökkäävä)      | 39               | uncertain (epävarma)      | 34               |
| passionate (kiihkeä)        | 32               | sluggish (veltto)         | 27               |
| intense (kiivas)            | 23               | lazy (laiska)             | 26               |
| provoked (ärsyyntynyt)      | 23               | depressed (masentunut)    | 19               |
| nervous (hermostunut)       | 21               | dissatisfied (tyytymätön) | 18               |
| unsettled (rauhaton)        | 13               | distressed (ahdistunut)   | 18               |
| irritated (ärtynyt)         | 13               | sorrowful (murheellinen)  | 16               |
| restless (levoton)          | 10               | dejected (allapäin)       | 15               |
|                             |                  | exhausted (uupunut)       | 15               |
|                             |                  | afraid (pelokas)          | 15               |

Note. The table is constructed using the descriptive findings for all adjectives (see Appendix 9)

Furthermore, the impact of emotion on performance was observed to be mixed between the players (see Appendix 9). In the case of the 44 positive emotion

descriptions, 23 % were selected by players only for the optimal category, and 11 % were used only in the dysfunctional category, whereas 66 % were selected for both the optimal and dysfunctional categories. Similarly, for the 38 negative emotion description, 11 % were used only as optimal, 37 % only as dysfunctional, while 53 % were selected for both categories. These findings indicate that the impact of emotion on performance is at least for some emotions (selected for both categories) bi-directional. The results are consistent with the earlier findings (Hanin 1997a; Hanin & Syrjä 1995a, b).

### **6.1.2 The patterns of emotion content: Repeated assessments**

The aim of the following comparisons was to examine to what extent players change their emotion descriptions in identifying their second and third profiles. These analyses were done at the intraindividual level. The purpose was also to investigate the effect of the repeated assessments on the patterns of the emotion content at the inter-individual and within-group levels.

Among those 24 players who participated in the repeated assessments, two had difficulties identifying any positive distracting emotions for the initial profile. These players were left out of the following comparisons. Consequently, only the 22 players with first and second, and 10 players with first, second, and third measurements were used in the analyses.

#### **Intraindividual content overlaps between the repeated assessments**

The amount of content overlap was calculated for each player separately indicating to what extent the emotion descriptions are similar and dissimilar between the repeated assessments. These calculations were first executed between the first and second, and then between the second and third measurements. The mean, standard deviation and range of the overlap scores between both matched-pairs are reported in Table 8.

*Between the first and second assessment*, the similarity of the total emotion list (P+N+P-N-) was found to be moderate, ranging from 0.21 to 0.70 ( $M = 0.43$ ). In the P+ category the similarity was on average 0.46, in the N+ category 0.55, in the P- category 0.33, and in the N- category 0.40. For the joint emotion categories the similarities were observed to be on the average 0.49 for the P+N+ emotions and 0.37 for the P-N- emotions. The results indicate that for all the other categories the players changed more than a half of the emotion descriptions when developing their second profile, except for the N+ category. Thus, the stability of emotion content seems to be intraindividually relatively low. The effect of increasing awareness could be one possible explanation for these changes. If players are not aware of their optimal and dysfunctional emotions at the time of the initial assessment and if players actively start to think about and use them, changes of this magnitude could follow. However, the effect of awareness on the changes should decrease after several repeated assessments.

TABLE 8 The mean (M), standard deviation (SD) and range of the intraindividual overlap scores in emotion content between the first and second (n = 22) and between the second and third (n = 10) assessments

| Emotion content | First vs. Second assessments |       | Second vs. Third assessments |       |
|-----------------|------------------------------|-------|------------------------------|-------|
|                 | M ± SD                       | Range | M ± SD                       | Range |
| P+              | 0.46 ± 0.22                  | 0.80  | 0.58 ± 0.17                  | 0.55  |
| N+              | 0.55 ± 0.28                  | 1.00  | 0.53 ± 0.21                  | 0.57  |
| P-              | 0.33 ± 0.25                  | 0.82  | 0.36 ± 0.36                  | 1.00  |
| N-              | 0.40 ± 0.27                  | 1.00  | 0.57 ± 0.27                  | 0.78  |
| P+N+            | 0.49 ± 0.19                  | 0.68  | 0.56 ± 0.14                  | 0.40  |
| P-N-            | 0.37 ± 0.18                  | 0.71  | 0.48 ± 0.24                  | 0.71  |
| P+N+P-N-        | 0.43 ± 0.15                  | 0.50  | 0.52 ± 0.15                  | 0.49  |

Note. The amount of overlap presents the similarity between two lists of emotions. Overlap scores can range from 0 (totally dissimilar) to 1 (totally similar)

Note. The time interval between the first and second assessments ranged from 42 to 217 days and between the second and third assessments from 168 to 209 days.

Between the second and third assessment, the amount of content overlap ranged from 0.35 to 0.83 (M = 0.52) for the total emotion list (Table 8). The highest overlaps were observed in the P+ category (M=0.58), followed by the N- category (M = 0.57) and the N+ category (M = 0.53), and the lowest in the P- category (M = 0.36). The lowest similarity in the P- category could indicate that these emotions are relatively unusual for soccer players. Overall, the findings show that the changes in emotion content remained at quite a high level between the second and third assessments. It seems that athletes need at least several repeated assessments before they can accurately define their emotional experiences. This idea is also supported by the observation that all the players, including the two who did not have any emotion descriptions in the P- category at the initial assessment, had selected emotion descriptions for all the emotion categories in creating their second and third profiles.

In addition, the emotion content was observed to be more similar between the second and third than between the first and second assessments. The within-group overlap scores (means) were higher in all the emotion categories (see Table 8). However, using the players who had all three profile measurements (n = 10), the overlap scores between the matched-pairs (first vs. second and second vs. third) showed non-significant differences for all the categories (Sign test). These results indicate that some of the players changed their emotion content even more between the second and third measurements than they did between the first and second.

One explanation for this finding could be that between the first and second profile measurements, none of the players (who had all three profiles) had task-related situational emotion measurements (see Table 4) in which they could actively use their emotion profile. The lack of these measurements might have had an influence on the size of the changes. It might be that without such active use, a player's awareness does not increase as it would if the

measurements were carried out. This issue could in part be examined by looking at the frequency of the task-related measurements that were executed between the second and third emotion profile assessments. The Spearman rank-order correlation coefficient ( $r_s$ ) was calculated for the comparison between the overlap scores and number of task-related measurements. The results indicated a significant positive correlation ( $r_s = 0.74, p < 0.05$ ) for N+ emotions, but not for any other adjective lists. The finding shows that the more the players had task-related measurements the more they changed their N+ emotions between the second and third assessment. This observation suggests that at least for N+ emotions, players need active use of their emotion profile before they are able to accurately define the most appropriate adjectives.

It is also worth pointing out that for 14 players between the first and second and for 4 players between the second and third assessments the same adjective was observed in a functionally different emotion category. One player, for instance, used the word "restless" in the N- category for the second profile and in the N+ category for the third profile. There were also 21 cases where players selected the same word for the first and third profile but not for the second. These findings indicate that players actively re-organise their emotion profiles, and thus support the notion of increasing awareness. Nevertheless, also other possible reasons why the players changed their emotion content between the measurements will be offered in the summary section (see chapter 6.1.3).

#### **Inter-individual emotion patterns across repeated assessments**

The influence of the repeated assessments on the inter-individual variability in emotion content were examined using the emotion profiles of the 10 players that had all three assessments. Similarly as was done for the initial emotion profiles, each player's emotion list was contrasted with the other players' lists by calculating the amount of content overlap.

The inter-individual content overlap scores of the total emotion list (P+N+P-N-) were observed to be on average about 0.25 in each measurement (Table 9). In addition, the Friedman test indicated a significant difference in the overlap scores between the three measurements only in the N- category ( $\chi^2 = 15.8, p < 0.001$ ). The results showed that the amount of similarity between the players' lists of emotion descriptions was at a similar low level for each the three assessments. In other words, there seems to be no temporal effect on the inter-individual variability in emotion content. The results support the assumptions of the IZOF model regarding the dimension of content.

TABLE 9 The mean (M), standard deviation (SD) and range of the inter-individual overlap scores in emotion content in each repeated assessment (n = 10)

| Emotion content | First assessment |       | Second assessment |       | Third assessment |       |
|-----------------|------------------|-------|-------------------|-------|------------------|-------|
|                 | M ± SD           | Range | M ± SD            | Range | M ± SD           | Range |
| P+              | 0.27 ± 0.20      | 0.67  | 0.21 ± 0.19       | 0.67  | 0.26 ± 0.18      | 0.67  |
| N+              | 0.30 ± 0.21      | 0.77  | 0.32 ± 0.19       | 0.75  | 0.33 ± 0.27      | 0.89  |
| P-              | 0.20 ± 0.27      | 1.00  | 0.13 ± 0.17       | 0.52  | 0.19 ± 0.19      | 0.60  |
| N-              | 0.18 ± 0.18      | 0.60  | 0.39 ± 0.21       | 0.80  | 0.28 ± 0.21      | 0.75  |
| P+N+            | 0.23 ± 0.17      | 0.59  | 0.21 ± 0.13       | 0.56  | 0.25 ± 0.16      | 0.78  |
| P-N-            | 0.27 ± 0.17      | 0.63  | 0.34 ± 0.15       | 0.67  | 0.29 ± 0.13      | 0.47  |
| P+N+P-N-        | 0.25 ± 0.13      | 0.61  | 0.27 ± 0.11       | 0.48  | 0.27 ± 0.11      | 0.56  |

Note. The amount of overlap shows the similarity between two lists of emotions. Overlap scores can range from 0 (totally dissimilar) to 1 (totally similar)

Note. The time interval between the first and second assessments ranged from 42 to 217 days and between the second and third assessments from 168 to 209 days.

### Within-group emotion patterns across repeated assessments

The group level frequencies of each emotion description, including all the adjectives on the stimulus list and the players' own words (even where they were not selected for any of the individual emotion profiles), were compared across the three measurements by calculating the Spearman rank-order correlation coefficient ( $r_s$ ). A significant positive correlation was observed in all the four emotion categories between the first and second, second and third, and first and third matched-pairs (Table 10). The correlation coefficients ranged from 0.56 to 0.79.

TABLE 10 The correlation coefficients (Spearman) of the within-group frequencies of each emotion descriptions in the stimulus list between the first and second (n = 22), between the second and third (n = 10), and between the first and third (n = 10) assessments

| Assessment comparison    | Emotion content |          |          |          |
|--------------------------|-----------------|----------|----------|----------|
|                          | P+              | N+       | P-       | N-       |
| First profile vs. Second | 0.76 ***        | 0.79 *** | 0.58 *** | 0.74 *** |
| Second profile vs. Third | 0.63 ***        | 0.73 *** | 0.68 *** | 0.72 *** |
| First profile vs. Third  | 0.72 ***        | 0.76 *** | 0.56 *** | 0.61 *** |

\*\*\*  $p < 0.001$

Note. The comparisons were done using all the adjectives on the stimulus list (and players' own words, whether or not they were selected), even where they were not selected for any of the individual emotion profiles.

These results indicated the existence of a strong positive correlation in the selection of adjectives between the three measurements. The within-group patterns of the emotion content would seem to remain rather stable across

repeated assessments. On each occasion at the group level not only were similar emotion descriptions from the stimulus list selected, but certain specific adjectives, the core emotion descriptions in the soccer context (see Table 7), were also preferred. This finding supports the view that it is possible to create aggregate emotion lists indicating the most relevant (core) emotions within a specific sport or task (see chapter 7 for a discussion).

It was further observed that the within-group frequency of the adjectives selected to indicate only optimal, dysfunctional, or both impacts on performance remained at a relatively similar level across the three measurements. Using the group level observation of the players ( $n = 10$ ) who had all three measurements, it was found that from 22 to 29 % of the positive emotion descriptions were selected for both the optimal and dysfunctional emotion categories in each measurement (Table 11). Also about one fourth, ranging from 18 to 33 %, of the negative adjectives were used by one player as helpful and by another as harmful. The frequency of the adjectives found in only the optimal or dysfunctional emotion categories also remained at a rather similar level across the measurements (see Table 11). The result, again, indicates that regardless of repeated assessments the within-group emotion patterns were highly stable.

TABLE 11 The frequency (%) of positive (P+ and P-) and negative (N+ and N-) emotion descriptions observed in only the optimal (Opt), dysfunctional (Dys), or both of these emotion categories in each three assessments ( $n = 10$ )

| Assessment             | Positive adjectives |     |      | Negative adjectives |     |      |
|------------------------|---------------------|-----|------|---------------------|-----|------|
|                        | Opt                 | Dys | Both | Opt                 | Dys | Both |
| First emotion profile  | 44                  | 34  | 22   | 23                  | 43  | 33   |
| Second emotion profile | 38                  | 32  | 29   | 29                  | 43  | 29   |
| Third emotion profile  | 38                  | 38  | 24   | 29                  | 54  | 18   |

The content overlap of the adjectives on the stimulus list (or players' own words) that were observed in only the optimal, dysfunctional, both or none of these emotion categories (not selected by any player) was additionally calculated between the first and second, between the second and third, and between the first and third measurements (Table 12). As seen from the table, there was a fairly high content overlap score between the emotion descriptions in each of the three matched-pairs that were selected for the negative dysfunctional category (range 0.72 to 0.86) and between the adjectives that were not selected by any player (range 0.62 to 0.78). A moderate content overlap score was found between emotion descriptions that were observed in both of the emotion categories (range 0.28 to 0.63), in the optimal category only (0.37 to 0.67), and in the positive dysfunctional category only (0.40 to 0.56). These results show that the emotions that have only an enhancing, impairing or both effects on performance remained fairly stable across the measurements. However, it is not possible on the basis of the present data (see chapter 6.2) to

indicate which emotions definitely have both and which have only a helpful or harmful influence on performance. This issue needs further study.

TABLE 12 The content overlap of the positive (P+ and P-) and negative (N+ and N-) adjectives in the stimulus list observed in only the optimal, dysfunctional, both or none (not selected by any player) of these emotion categories between the assessments (n = 10)

| Emotion category | Positive adjectives |                  |                 | Negative adjectives |                  |                 |
|------------------|---------------------|------------------|-----------------|---------------------|------------------|-----------------|
|                  | First vs. Second    | Second vs. Third | First vs. Third | First vs. Second    | Second vs. Third | First vs. Third |
| Optimal          | 0.37                | 0.62             | 0.67            | 0.40                | 0.50             | 0.40            |
| Dysfunctional    | 0.55                | 0.59             | 0.42            | 0.72                | 0.82             | 0.86            |
| Both             | 0.48                | 0.56             | 0.40            | 0.45                | 0.63             | 0.28            |
| Not selected     | 0.62                | 0.67             | 0.62            | 0.67                | 0.70             | 0.78            |

Note. The amount of overlap shows the similarity between two lists of emotions. Overlap scores can range from 0 (totally dissimilar) to 1 (identical)

Note. The comparisons were done using all the adjectives on the stimulus list (and players' own words)

### 6.1.3 Summary and interpretation

Consistent with earlier investigations (Hanin, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b, 1996), the content of the individual-generated emotion profiles was observed to be very different between the players and between the emotion categories. The results provide support for the IZOF-based assumptions with regard to the dimension of content. The findings suggest that emotion content should be taken into account in exploring performance-related emotions in addition to the intensity dimension of emotion which has dominated the earlier IZOF-based studies (e.g. Hanin, 1978, 1986). Thus, the idiographic scaling procedure, consisting of the four functionally different emotion categories, was clearly supported in the present study.

Each player selected rather unique emotion descriptions for their emotion profiles. This was observed at both inter-individual and group level. In the inter-individual comparisons, very low similarity scores were observed for the total emotion list (0.23) and for all the sub-lists (from 0.17 to 0.30). At the level of group comparisons the same adjective was observed for one player to be in the optimal category and for another player to be in the dysfunctional category. Altogether 66 % of positive and 53 % of negative words came into this category. It was also noticed that the players felt different emotions prior to and during successful performance than they feel before and during unsuccessful performance.

The differences in emotion content can be explained by reference to athletes' different characteristics, needs, and experiences. The emotion descriptions could reflect, for instance, sport- (team sport, contact sport, a game) or task-related (offence, defence, goal-keeper) demands, situational

demands (e.g. referees' mistakes), or an idiosyncratic way of playing (physical or technical). On the other hand, they might reflect players' individual characteristics regarding level of skill, strength, speed, or physical size or their psychological features (e.g. personality characteristics such as temperament). A discrete coping process (see Lazarus, 1996; chapter 2.1.1) could also explain the high inter-individual variability. Therefore, individual-generated emotion scales are not only sport- or task-specific but also athlete-specific.

The present study extended the IZOF-based research to the temporal patterns of emotion content. The intraindividual comparisons indicated that the players changed their adjectives when re-developing their emotion profile. The overlap scores showed that of the players' total emotion list only about 43 % were similar between the first and second, and about 52 % between the second and third measurements. It was assumed that players' increasing awareness of their own helpful and harmful emotions, could be the one of the key explanations for these changes. By increased awareness of their own helpful and harmful emotions, the players could actively re-construct their emotion profiles. Another possible explanation could concerns changes in current personal status regarding, for instance, game position, the win-loss history of the team, the personal success in games, or personal health (e.g. injuries). For example, a discrete game position (defence or offence) could demand emotions of a different kind from a player. A third issue explaining the changes in the content of emotions could be the use of the near synonyms or closely related words (e.g. tired and exhausted). It is possible that between assessments some of the athletes might use different but closely related words (e.g. near synonyms) to describe a similar emotional experience. A fourth explanation could be the learning effect of the use of the instrument, and the last issue concerns the effect of mistakes or errors in identifying individual adjectives. Additional research explaining why athletes change their emotion descriptions is needed.

Despite the temporal changes at the intraindividual level, the findings showed that the inter-individual and within-group patterns of emotion content remained fairly similar from one measurement to the next. The level of inter-individual overlap of emotion content was about 25 % for each assessment. The group level comparisons indicated that in each assessment the players preferred similar words with similar frequencies ( $r_s = 0.59$  to  $0.79$ ,  $p < 0.001$ ). This suggests that on each occasion the same emotion descriptions could be listed as core adjectives in the soccer context such as "tense", "dissatisfied", "carefree", "energetic", "tired", "charged", "confident", "aggressive", "uncertain", "motivated", and "satisfied" (top ten most frequently selected adjectives). It was also found that the within-group frequencies of emotion descriptions observed only as helpful, harmful, or both helpful and harmful stayed at a rather similar level across the assessments. However, on the basis of the present data it remains unclear which emotions definitely have only an enhancing influence, which have only an impairing influence, and which could have both impacts on performance.



## 6.2 Optimal and dysfunctional intensity zones

To develop their emotion profiles, the players were further requested to identify for each helpful emotion descriptor an optimal zone, indicating the level of intensity in successful performance, and for each harmful emotion descriptor a dysfunctional zone, indicating the level of intensity in unsuccessful performance. The 5 players who had no words in their initial P- emotion category were not included into the following comparisons. Thus, 57 players' initial intensity zones will first be examined. The patterns of optimal and dysfunctional zones after repeated measurements will then be analysed in the 22 players with two emotion profiles and in the 10 players with three profiles. The analyses were carried out at the intraindividual, inter-individual, and within-group levels.

### 6.2.1 The patterns of the intensity zones: Initial assessment

The goal of the following analyses was to examine what patterns of optimal and dysfunctional zones emerged in the initial emotion profiles. A special topic was to see what the levels of the optimal and dysfunctional intensity zones were and to what extent the players describe the zones using single values (a specific level) or several values (a range).

#### Intraindividual comparisons

Each player's optimal and dysfunctional zones were observed to vary between different adjectives and different emotion categories; see Table 2 and Table 3 (p. 46). Similar observations were found for all the players. The finding is consistent with earlier studies (Hanin & Syrjä, 1995a, b).

The optimal and dysfunctional zones of the adjectives that were selected by players for both the P+ and P-, or N+ and N- categories (see intraindividual comparisons in chapter 6.1.1) were found to be different in all cases (Appendix 10). This observation suggests that at least for these emotions their impact on performance depends on the level of intensity, which suggests that the instructions used within the individualised emotion profiling method should be extended to identify the impact of an emotion across a whole range of intensities from nothing at all to the maximum possible.

#### Inter-individual comparisons

The optimal zones of the most selected negative adjective, "tense", are presented as a typical example in Figure 3.

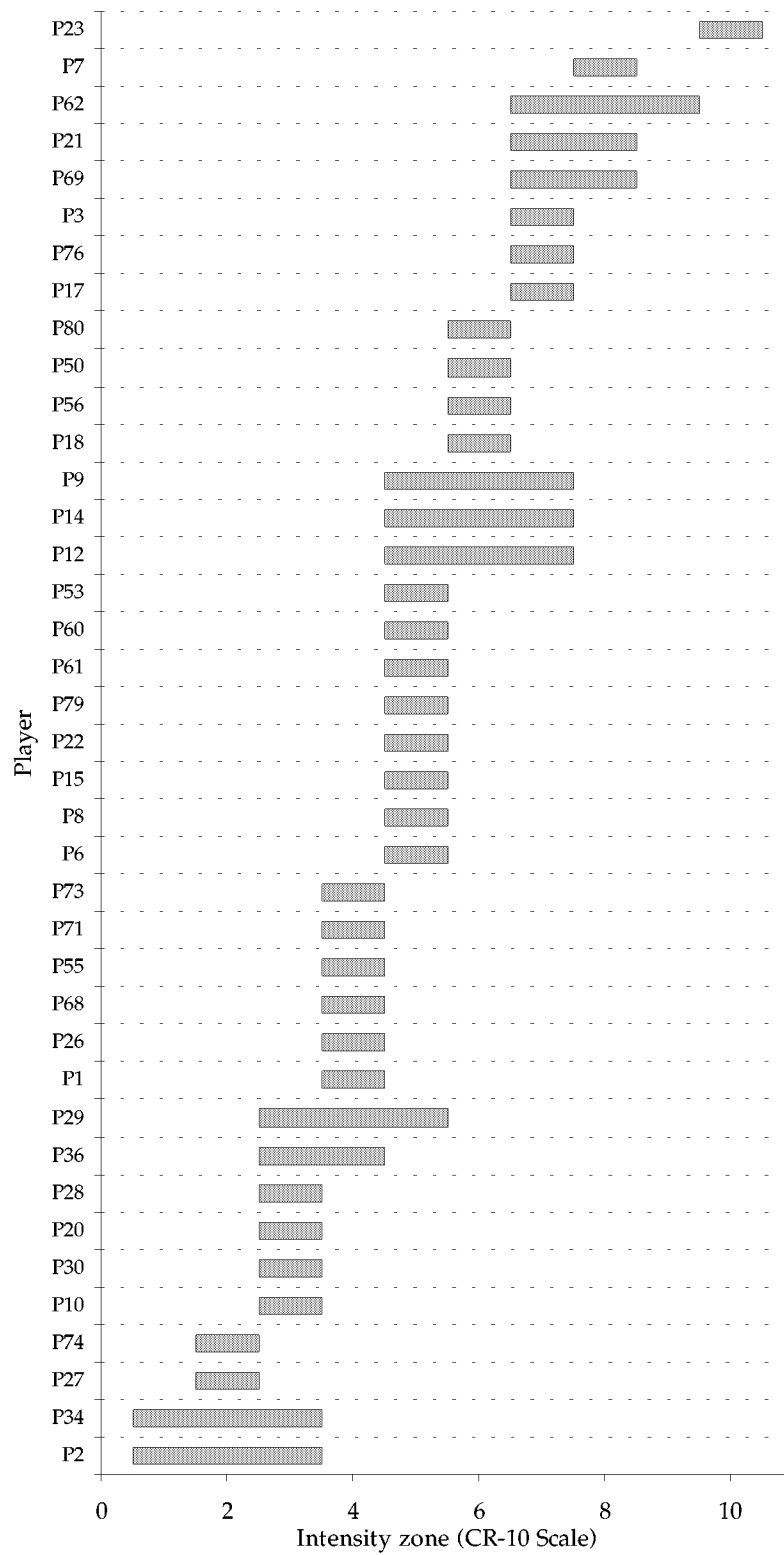


FIGURE 3 Optimal intensity zones ( $\pm 0.5$ ) of emotion "tense" (jännittynyt) (n=39)

As expected, the optimal zones of this particular emotion description were low, moderate, or high depending on the individuals. A similar observation was found for the most of optimal and dysfunctional emotions, as seen in Appendix 9, in which the descriptive findings of the zone medians and ranges for each of the positive (P+ and P-) and negative (N+ and N-) emotions across the whole sample are presented. The findings support the IZOF assumption and are consistent with earlier studies of pre-competitive anxiety (e.g. Jokela & Hanin, 1997; Hanin, 1978, 1986; Raglin, 1992) and with studies examining positive and negative emotions (Hanin, 1997a; Hanin & Syrjä, 1995a, b).

The Figure 3 also showed that some of the players described their intensity zones using a specific level (one single value), whereas other players used a wider range (at least two values). This issue will be elaborated along the within-group comparisons.

### Within-group comparisons

The median, percentile (25 and 75 %), minimum, and maximum levels and outliers of the players' intensity zones (zone medians were used for players with a wide range) across the whole sample (n = 57) are presented in Figure 4.

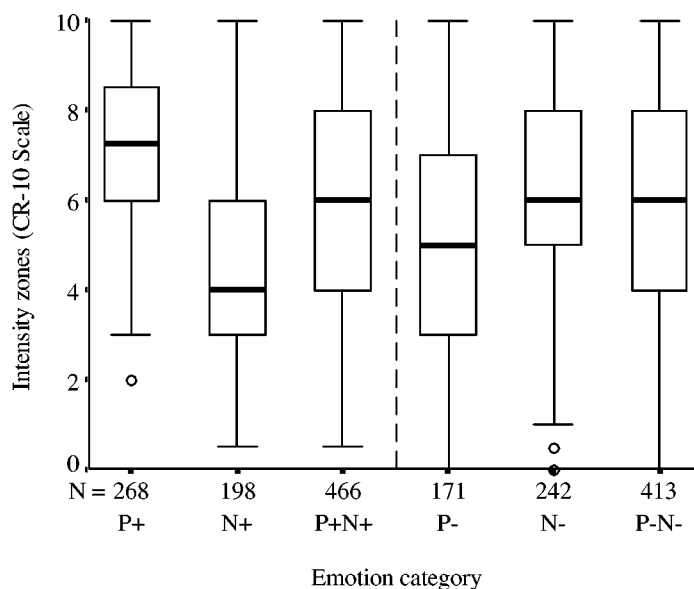


FIGURE 4 Median (bold line), percentile (25 % and 75 %, bar), minimum, and maximum (narrow vertical lines) levels and outliers (o) of optimal (P+, N+ and P+N+) and dysfunctional (P-, N-, and P-N-) intensity zones across the whole sample (zone medians were used for the players with a wide range; N as figure denotes number of adjectives; N of players = 57)

As the figure shows, the optimal zones were typically observed to be at quite high level for P+ emotions (median = 7.5), whereas for N+ emotions the typical zones were observed at a moderate level (4). Similar comparison for dysfunctional emotions revealed that the zones for the P- words were typically at a lower level (5) than for the N- adjectives (6). Using the Mann-Whitney test, a significant difference between the P+ and N+ ( $p < 0.001$ ), and between the P- and N- ( $p < 0.001$ ) emotion categories was found, indicating that the within-group level of optimal and dysfunctional zones between positive and negative emotions was different in both categories. The findings, again, provide support for the distinction between the four emotion categories.

*The range of the intensity zones.* Within the framework of the ZOF model, it was assumed that the intensity zones would have a wide range ( $\pm 4$  points in STAI scale) rather than a specific level (e.g. Hanin, 1978, 1986). This assumption was now examined regarding the optimal and dysfunctional zones. It is notable to indicate that the players were instructed to identify their zones either as a specific level (using a single value) or a wider range (using several,  $> 2$ , values). Therefore this issues was analysed by classifying the zones into two groups. The first group contains all the intensity zones described by the players using a single value only (a specific level), while the second group consists of the zones which were described using at least two values (a range). In 81 % of the total of 57 players' 879 adjectives intensity zones were observed as a level (Table 13), while only 19 % of the zones were defined as a wide range. These results do not provide support for the notion proposed within the IZOF model. On the other hand, the findings could indicate that for the initial description of optimal and dysfunctional zones the player may have insufficient awareness to identify ranges. Therefore, the case should be different after repeated assessments (see the last paragraph in chapter 6.2.2).

TABLE 13 The frequencies (%) of optimal and dysfunctional intensity zones described using a single value (level) and several values (range) (n = 57)

| Range of scores | Frequency of optimal and dysfunctional zones (%) |    |    |    |      |      |          |
|-----------------|--|----|----|----|------|------|----------|
|                 | P+   | N+ | P- | N- | P+N+ | P-N- | P+N+P-N- |
| Specific level  | 79   | 83 | 81 | 81 | 81   | 81   | 81       |
| Wider range     | 21   | 17 | 19 | 19 | 19   | 19   | 19       |

Note. Specific level = intensity zones described using a single value only  
Wider range = intensity zones described using at least two values

### 6.2.2 The patterns of the intensity zones: Repeated assessments

The aim of the following comparisons was to examine to what extent players change their intensity zones in identifying their second and third profiles. This analysis was performed at the intraindividual level. Another purpose was to

explore the effect of the repeated assessments on the inter-individual and within-group patterns of optimal and dysfunctional zones.

### **Intraindividual intensity zones between the repeated assessments**

At the individual level, the inter-assessment comparisons were done with the emotion descriptions that the players used at least in two emotion profiles. Due to this limitation, the emotion categories were not considered in the following comparisons. The median level of intensity zones (zone level) of these adjectives were contrasted and classified into two groups: similar and dissimilar. The zone levels were categorised as similar, if the difference between repeated assessments was zero or  $\pm 1$  (less than one standard error on Borg's CR-10 scale). Because players were given the possibility to use ranges (several values) as well as levels (one value) in defining their optimal and dysfunctional zones, the difference between the repeated assessments were further examined by comparing the zone ranges. The same criteria and groups (similar and dissimilar) were used. The intraindividual frequencies of similar zone levels and zone ranges between repeated assessments are reported in Table 14.

*Zone level difference.* As seen from Table 14, between the first and second assessment the frequency of similar zone levels ranged from 13 to 75 % of the adjectives depending on the player ( $M = 45$ ,  $SD = 20$ ). Between the second and third assessment the frequency of similar zone levels ranged from 0 to 63 % of adjectives across the players ( $M = 42$ ,  $SD = 20$ ). These results indicate that for most (about 55 %) of the emotion descriptions the players re-defined their intensity zones when developing their second and / or third emotion profiles.

*Zone range difference.* Examination of the zone ranges between the repeated assessments showed that although the zone level were observed as similar, in some cases the players changed their way of describing the zones by using several values instead of just one value. For example, player 2's zone levels were in 71 % of cases similar in the first and second assessments; however, the difference in the zone range of these adjectives was dissimilar in all cases (see Table 14). In fact, if all the similar zone levels are considered, dissimilar difference in range was observed in 25 % of these cases between the first and second and in 70 % of these cases between the second and third assessments. Thus, it would be relatively safe to conclude that the players re-described their optimal and dysfunctional zones for the most of the emotion descriptions if they were used again for the repeated profile.

It is also notable that the optimal and dysfunctional intensity zones of the adjectives that were selected by a same player for a functionally different emotion category for the repeated assessment (see intraindividual comparisons in chapter 6.1.2) were found to be dissimilar in all cases ( $n = 14$ ) (Appendix 11). The findings support the view that players' increased awareness of their emotions could be a key explanation for the changes in the emotion profiles between the repeated measurements. Additionally, the observations support the idea that emotions could have both impacts, helpful and harmful, on performance depending on their intensity.

TABLE 14 The intraindividual frequencies (%) of similar zone levels (median) and zone ranges between the first and second (n = 22) and between the second and third (n = 10) assessments

| Player | First vs. Second assessment  |                         |                         | Second vs. Third assessment  |                         |                         |
|--------|------------------------------|-------------------------|-------------------------|------------------------------|-------------------------|-------------------------|
|        | N of adjectives <sup>a</sup> | N of similar levels (%) | N of similar ranges (%) | N of adjectives <sup>a</sup> | N of similar levels (%) | N of similar ranges (%) |
| P2     | 7                            | 71                      | 0                       | 7                            | 57                      | 14                      |
| P3     | 13                           | 54                      | 100                     | 15                           | 60                      | 0                       |
| P4     | 4                            | 50                      | 100                     | 5                            | 40                      | 100                     |
| P5     | 3                            | 67                      | 100                     | 8                            | 63                      | 38                      |
| P6     | 10                           | 30                      | 100                     | 12                           | 25                      | 83                      |
| P8     | 7                            | 14                      | 86                      | 8                            | 50                      | 13                      |
| P9     | 11                           | 45                      | 73                      | 10                           | 0                       | 80                      |
| P10    | 9                            | 44                      | 56                      | 9                            | 33                      | 33                      |
| P11    | 8                            | 13                      | 100                     |                              |                         |                         |
| P12    | 4                            | 25                      | 75                      | 7                            | 29                      | 57                      |
| P14    | 7                            | 71                      | 43                      |                              |                         |                         |
| P16    | 4                            | 75                      | 100                     |                              |                         |                         |
| P17    | 6                            | 17                      | 100                     | 8                            | 63                      | 100                     |
| P19    | 3                            | 33                      | 100                     |                              |                         |                         |
| P20    | 9                            | 22                      | 100                     |                              |                         |                         |
| P21    | 9                            | 33                      | 78                      |                              |                         |                         |
| P22    | 10                           | 60                      | 50                      |                              |                         |                         |
| P26    | 5                            | 60                      | 100                     |                              |                         |                         |
| P27    | 3                            | 67                      | 100                     |                              |                         |                         |
| P28    | 9                            | 22                      | 67                      |                              |                         |                         |
| P29    | 11                           | 45                      | 73                      |                              |                         |                         |
| P30    | 5                            | 60                      | 40                      |                              |                         |                         |
| Mean   | 7                            | 45                      | 79                      | 9                            | 42                      | 52                      |
| SD     | 3                            | 20                      | 27                      | 3                            | 20                      | 37                      |

<sup>a</sup> Frequency of similar emotion descriptions observed in both emotion profiles

Note. Similar intensity zone: level A – level B = zero or  $\pm 1$  (< 1 standard error on the CR-10 scale)

Note. The time interval between the first and second assessments ranged from 42 to 217 days and between the second and third assessments from 168 to 209 days.

### Inter-individual emotion patterns across repeated assessments

As an illustration, Figure 5 presents the inter-individual variability of the dysfunctional intensity zones of the word “carefree” in each of the three measurements using 5 players who had selected the word for all three profiles. As seen from Figure 5, the intensity zones varied across the players in each case. Despite the relatively low number of players, this example suggests that the inter-individual patterns of intensity zones remained at quite a low level of similarity across all three assessments. The assumption of the IZOF model was supported.

It is also noteworthy to notice that the inter-personal ranking is different in each measurement. The ranking of all the possible emotion descriptions (12 adjectives, which were selected at least by 5 players) were contrasted using the Spearman Rank-Order correlation coefficient ( $r_s$ ). The results indicated a non-significant correlation for all the adjectives. The finding indicates that even where a player's intensity zone is be in "a low intensity group" after the first assessment, it may be in "a high intensity group" after the second measurement.

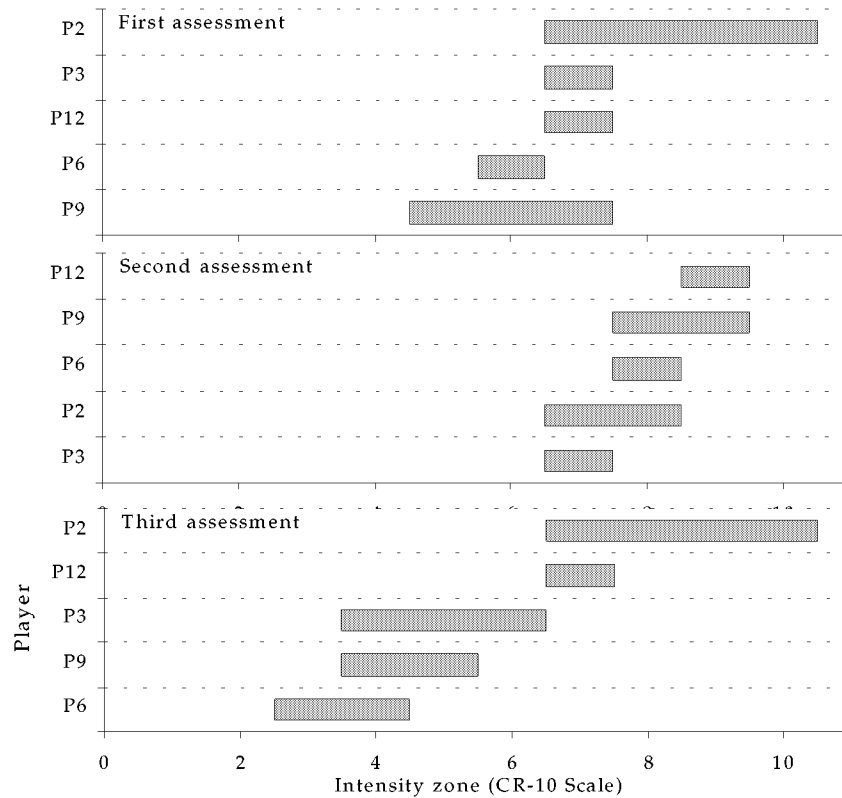


FIGURE 5 The dysfunctional intensity zones ( $\pm 0.5$ ) of emotion description "carefree" (*huoleton*) in the first, second, and third measurement ( $n = 5$ )

### Within-group emotion patterns across repeated assessments

The effect of repeated assessments on within-group emotion patterns were analysed with the emotion profiles of the 10 players' who had all the three measurements. Figure 6 presents the median, percentile (25 and 75 %), minimum and maximum levels and outliers of all the optimal and dysfunctional intensity zones (zone medians were used for the players with a wide range) in each of the three assessments. As seen from Figure 6, the optimal and dysfunctional zones are at a rather similar level after the repeated assessments. The zones in each category were contrasted using the Kruskal-

Wallis One-way Anova. Non-significant differences were observed in all the other emotion categories except for the P- category ( $\chi^2 = 11.8$ ,  $p < 0.01$ ). The results indicate that the within-group patterns of intensity zones remained quite stable across the measurements. The finding suggests that tentative optimal and dysfunctional levels of sport- or task-specific intensities can be recommended.

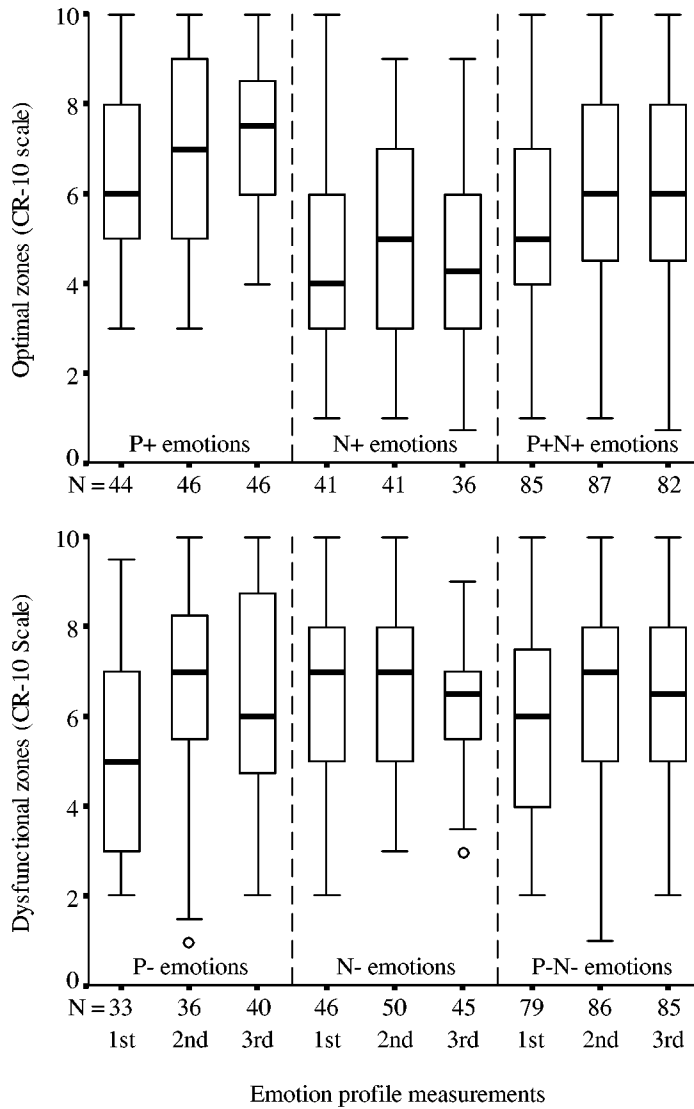


FIGURE 6 The median (bold line), percentile (25 and 75 %; bar), minimum and maximum (narrow vertical lines) levels and outliers (o) of optimal (P+, N+, and P+N+) and dysfunctional (P-, N-, and P-N-) intensity zones in first (1st), second (2nd), and third (3rd) emotion profile measurements (zone medians were used for the players with a wide range; N in figures denotes number of adjectives; N of players = 10)



*The range of the intensity zones.* The temporal effect on the descriptions of optimal and dysfunctional zones using a single value (a specific level) or several values (a range) was examined by classifying the zones into two groups: zones defined as a single value; and zones defined using at least two values. The frequencies of the intensity zones within both groups were calculated across the whole sample ( $n = 10$ ) for all measurements separately (Table 15). For the first two profiles, the players described optimal and dysfunctional zones using a single value for 84 % of all adjectives. However, for the third measurement, 66 % of the optimal and dysfunctional zones were identified with several values (wider range). This result provides support for the IZOF assumptions, and is consistent with earlier anxiety-based studies using the ZOF scores as a range ( $\pm 4$  points in STAI scale) (Hanin, 1978, 1986). The findings also provide support for the notion that players have increasing awareness of their emotions and thus players need repeated assessments before they are able to accurately describe their optimal and dysfunctional intensity zones.

TABLE 15 The frequencies (%) of optimal and dysfunctional intensity zones described as a specific level (a single value) and a wider range (several values) in the first, second and third assessments ( $n = 10$ )

| Assessment<br>The range of the score | Frequency of optimal and dysfunctional zones (%) |    |    |    |      |      |          |
|--------------------------------------|--|----|----|----|------|------|----------|
|                                      | P+   | N+ | P- | N- | P+N+ | P-N- | P+N+P-N- |
| First emotion profile                |  |    |    |    |      |      |          |
| Specific level                       | 86   | 83 | 88 | 80 | 85   | 84   | 84       |
| Wider range                          | 14   | 17 | 12 | 20 | 15   | 16   | 16       |
| Second emotion profile               |  |    |    |    |      |      |          |
| Specific level                       | 80   | 90 | 92 | 76 | 85   | 83   | 84       |
| Wider range                          | 20   | 10 | 8  | 24 | 15   | 17   | 16       |
| Third emotion profile                |  |    |    |    |      |      |          |
| Specific level                       | 30   | 44 | 40 | 24 | 37   | 32   | 34       |
| Wider range                          | 70   | 56 | 60 | 76 | 63   | 68   | 66       |

Note. Specific level = intensity zones described using a single value only

Wider range = intensity zones described using at least two values

Note. The time interval between the first and second assessments ranged from 42 to 217 days and between the second and third assessments from 168 to 209 days.

### 6.2.3 Summary and interpretation

As hypothesised, the optimal and dysfunctional intensity zones were found to be low, moderate, or high, and to vary for the same and different emotions across the players. A similar observation was made in all three emotion profiles. The findings are consistent with those of earlier studies (Hanin 1978, 1986, 1997a; Hanin & Syrjä, 1995a, b) and support the IZOF assumptions regarding the intensity dimension. Similarly to emotion content, the high variability in intensity could reflect individual characteristics (e.g. coping strategies) and game- or task-related demands.

At the group level comparisons, significantly different intensity zone levels were observed between positive and negative emotion descriptions in both the optimal and dysfunctional categories. It seems that in successful performance players' need to be more influenced by positive than negative emotions, whereas in unsuccessful performance players seems to be more easily distracted by positive than negative emotions. However, this finding indicates that emotions in the dysfunctional categories could have different personal meanings for players. The P- emotions could be distracting if they are lacking, while the N- emotions could be harmful only when they are present. This idea points out the importance of identifying the effect of an emotion across a whole range of intensities.

The examinations on the temporal patterns of emotion intensity extend the earlier IZOF-based studies. Similar findings to those in the analysis of emotion content, emerged for the intensity zones. At the intraindividual level, the comparisons indicated that in most of the cases the players changed their optimal and dysfunctional intensity zones if an emotion description was also selected for the repeated profile. The most crucial reasons for the changes are assumed to be players' enhancing awareness of their emotions and possible changes in current personal status (e.g. game position, win-loss history of the team, personal success in games, or personal health). However, the learning effect of the use of Borg's instrument and possible errors or mistakes in identifying the zones are also optional explanations. Whatever the reason, this observation indicates that from time to time individual-oriented emotion profiles need to be re-constructed. The inter-individual and within-group patterns of intensity zones, however, were found to remain rather similar from one measurement to the next. This finding suggests that the intensity zones of the same player could be low for the first profile but high for the second profile.

In addition, the examinations indicated that the players preferred specific levels, single figures, in identifying their zones at the initial and second assessments, but for the third profile they described optimal and dysfunctional zones using a wider range consisting of at least two values. The results seems to be partially consistent with those found using the STAI scale (Hanin, 1978, 1986), in which it was concluded that the optimal pre-competitive anxiety zone is the STAI score  $\pm 4$  points, and with those observed in the earlier IZOF-based studies (Hanin & Syrjä, 1995a, b). The findings of the present study suggest that at least some of the emotions function optimally or dysfunctionally with a wider range. However, this does not mean that the zones are wide for all the players and emotions. By extending the individualised emotion profiling procedure by identifying optimal and dysfunctional zones using a whole range of intensities, this issue could be analysed more properly. Nonetheless, these findings suggest that repeated assessments are necessary for describing individual intensity zones with ranges.

### 6.3 Task-related situational emotion patterns

Altogether 22 players were asked using predicted, current, and recalled measurements to describe their emotion intensities before and after four international games. The measurements were collected from seven situations including: 1) a current assessment in 24 hours before the game; 2) a prediction for just before the game made a 24 hours earlier; 3) a recalled assessment for during the first part of the first half (1/1 ht); 4) a recalled assessment for during the second part of the first half (2/1 ht); 5) a recalled assessment for during the first part of the second half (1/2 ht); 6) a recalled assessment for during the second part of the second half (2/2 ht); and 7) a current assessment 30 minutes after the game.

The situational emotion patterns were then examined on the intraindividual, inter-individual, and within-group levels. The aim was to describe how emotions vary during the time-interval from 24 hours before to 30 minutes after a soccer game. An additional issue was to explore whether the situational intensities vary differently in different players and at different performance levels.

#### Intraindividual comparisons

As a typical example, one player's situational emotion patterns using his intensity medians of the four categories (see chapter 5.4) in each game are presented in Figure 7. As the figure shows for this particular player the shape of the patterns for optimal emotions (P+ and N+) seems to have some similarities with the well known "iceberg" profile (see Morgan, 1980), while, the curve for dysfunctional emotions (P- and N-) seems to be the opposite. The intensities of dysfunctional emotions (P- and N-) in each game start from a higher level than those of the optimal emotions (P+ and N+), decrease to a lower level just before and during the game, and rises once again to the higher level after the game. This trend seems to be permanent for this particular player. A closer analysis shows that in each game the intensity medians of the P+ words are at the highest level, whereas the N- emotions seem to have the lowest intensities. The emotions in the N+ and P- categories, instead, are observed to vary around a rather similar moderate level. These observations clearly indicate that the emotion patterns are quite different between all four emotion categories.

It can be also pointed out that the situational intensities in the last part of the during-game activity (2/2 ht) were observed to be at a lower level in all the matches than during the other parts of the task execution. The optimal emotions (P+ and N+) show a loss of intensity, whereas the dysfunctional emotions (P- and N-) gain in intensity. This finding indicates that for this particular player the end of the games seems to be emotionally different from the other parts of the during-game activity. From the practical point of view, this means that he really needs to work on his optimal emotions during the last quarter of the game.

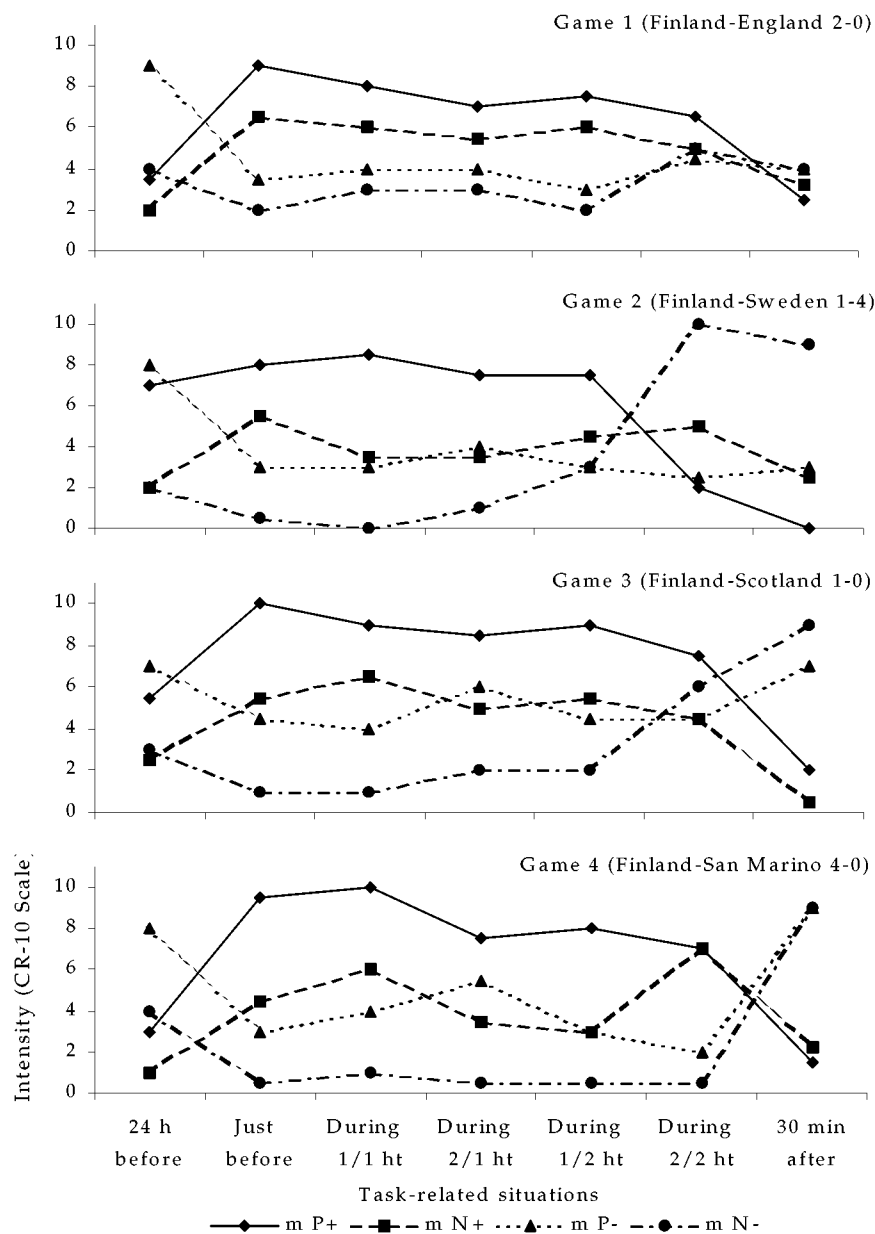


FIGURE 7 *Player 16's* intraindividual patterns of task-related situational emotions (intensity medians of the four emotion categories: m P+, m N+, m P-, and m N-) in each game

The case with the other players was not much different. Each player's situational intensities across the measurements in all matches were analysed using the Friedman two-way analysis of variance by ranks. The results are presented in Table 16. Situational intensities were found to be significantly

different across the measurements in at least one emotion category in 94 % of cases. Only in two cases was the significant variance not observed in any emotion category. Typically for each game, the significant differences were observed in three categories, but never in all. These findings clearly show that at the intraindividual level, emotions change over time for each player. Nevertheless, it seems that the emotions in the individual scales never all change at the same time. These observations suggest that players have certain “key emotions” for performance.

Including all 34 cases (see Table 16), the significant variance was most frequently observed in the P+ category in 68 % of cases, then in the N+ category (47), in the P- category (38), and the lowest in the N- category (26). The 15 % of cases with the total (P+N+P-N-) emotion category indicated that two functionally different groups of emotions (optimal and dysfunctional) varied differently across the situations. The results indicate that emotions change more often in optimal categories than in dysfunctional categories. In particular, the N- emotions had low intensities and varied far less, whereas the P+ emotions had high intensity and varied strongly. It seems that optimal emotions were more critical for performance than dysfunctional emotions. These observations provide clear support for the independence of the four emotion categories proposed in the IZOF model.

### **Inter-individual comparisons**

Since the players' emotion content is highly different, the present data does not allow to inter-individual level analysis by comparing situational intensities item by item. However, as a brief illustration, the results indicate that the situational intensities were fairly different for different players. For instance, players 12 and 10 are opposite examples. As seen from Table 16, for player 12 the significant differences can be observed in at least five emotion categories, while for player 10 the significant differences were found only in two or less emotion categories in the same game. In other words, emotions changed more dramatically across the situations for player 12, while for player 10 emotions remained relatively stable across the situations. This finding indicates that emotions change differently for different individuals. These pilot observations extend the IZOF-based hypothesis to consider situational emotion patterns. It should, however, be emphasised that this was just a brief illustration and that the inter-individual aspect needs to be more clearly indicated in future studies.

TABLE 16 The chi-square scores ( $\chi^2$ ) of the Friedman test indicating each players' individual variability in the task-related emotion intensities across the seven situations (n = 14 different players)

| Game<br>Player | Task-related emotion intensities |          |          |          |          |          |          |
|----------------|----------------------------------|----------|----------|----------|----------|----------|----------|
|                | P+                               | N+       | P-       | N-       | P+N+     | P-N-     | P+N+P-N- |
|                | $\chi^2$                         | $\chi^2$ | $\chi^2$ | $\chi^2$ | $\chi^2$ | $\chi^2$ | $\chi^2$ |
| <b>Game 1</b>  |                                  |          |          |          |          |          |          |
| P 2            | 16.8 *                           | 15.2 *   | 12.5     | 5.6      | 28.0 *** | 15.0 *   | 9.0      |
| P 3            | 4.7                              | 21.1 **  | 26.9 *** | 10.6     | 22.4 **  | 31.4 *** | 3.8      |
| P 10           | 15.2 *                           | 8.7      | 4.9      | 2.6      | 22.3 **  | 2.7      | 11.7     |
| P 12           | 16.6 *                           | 16.1 *   | 23.9 *** | 1.7      | 27.4 *** | 17.3 **  | 6.2      |
| P 16           | 12.5                             | 10.1     | 7.8      | 5.5      | 21.2 **  | 9.1      | 2.4      |
| <b>Game 2</b>  |                                  |          |          |          |          |          |          |
| P 3            | 26.7 ***                         | 12.1     | 12.7 *   | 9.3      | 27.1 *** | 17.8 **  | 1.9      |
| P 9            | 21.7 **                          | 8.1      | 6.6      | 13.7 *   | 14.9 *   | 11.4     | 5.8      |
| P 10           | 19.0 **                          | 9.1      | 8.8      | 4.5      | 6.6      | 2.6      | 4.9      |
| P 11           | 24.5 ***                         | 11.1     | 8.1      | 5.8      | 25.0 *** | 4.7      | 10.0     |
| P 12           | 20.5 **                          | 18.0 **  | 23.6 *** | 3.1      | 27.9 *** | 18.9 **  | 1.4      |
| P 14           | 23.6 ***                         | 6.9      | 3.4      | 15.5 *   | 22.4 **  | 13.7 *   | 7.8      |
| P 16           | 14.0 *                           | 9.3      | 9.8      | 24.8 *** | 12.9 *   | 15.1 *   | 3.1      |
| P 17           | 4.4                              | 5.8      | 14.6 *   | 10.1     | 6.6      | 14.3 *   | 15.3 *   |
| P 20           | 18.9 **                          | 10.1     | 3.7      | 18.9 **  | 14.0 *   | 14.0 *   | 11.9     |
| <b>Game 3</b>  |                                  |          |          |          |          |          |          |
| P 3            | 11.3                             | 24.1 *** | 26.4 *** | 10.7     | 32.5 *** | 34.8 *** | 1.9      |
| P 9            | 22.0 **                          | 15.5 *   | 10.4     | 14.2 *   | 34.6 *** | 8.0      | 12.9 *   |
| P 10           | 6.2                              | 2.8      | 6.1      | 1.8      | 6.8      | 1.6      | 4.6      |
| P 11           | 18.8 **                          | 12.8 *   | 7.1      | 7.4      | 20.2 **  | 7.4      | 5.4      |
| P 12           | 17.5 **                          | 19.1 **  | 21.2 **  | 12.8 *   | 32.5 *** | 30.4 *** | 3.7      |
| P 14           | 18.5 **                          | 11.4     | 4.5      | 21.8 **  | 21.4 **  | 12.8 *   | 2.7      |
| P 16           | 11.5                             | 17.1 **  | 8.1      | 18.9 **  | 27.3 *** | 22.6 *** | 0.6      |
| P 17           | 16.0 *                           | 20.3 **  | 5.3      | 7.0      | 34.4 *** | 8.7      | 8.4      |
| P 26           | 11.3                             | 14.5 *   | 7.7      | 9.6      | 23.9 *** | 6.9      | 13.1 *   |
| P 28           | 9.7                              | 3.5      | 14.8 *   | 3.0      | 9.0      | 4.9      | 1.8      |
| <b>Game 4</b>  |                                  |          |          |          |          |          |          |
| P 2            | 14.1 *                           | 9.6      | 12.1     | 9.8      | 8.5      | 16.9 **  | 5.3      |
| P 3            | 15.1 *                           | 16.7 *   | 20.8 **  | 13.6 *   | 30.0 *** | 32.8 *** | 0.5      |
| P 6            | 22.4 **                          | 17.4 **  | 18.5 **  | 6.0      | 36.2 *** | 19.2 **  | 15.7 *   |
| P 9            | 13.6 *                           | 10.0     | 7.1      | 6.7      | 19.7 **  | 8.8      | 4.0      |
| P 10           | 8.9                              | 7.1      | 12.7 *   | 9.5      | 10.5     | 7.1      | 7.7      |
| P 11           | 17.0 **                          | 20.0 **  | 10.2     | 4.1      | 29.2 *** | 11.9     | 7.0      |
| P 12           | 20.2 **                          | 18.6 **  | 25.0 *** | 10.4     | 34.8 *** | 30.7 *** | 2.5      |
| P 16           | 16.4 *                           | 11.2     | 22.6 *** | 10.8     | 25.4 *** | 25.6 *** | 8.9      |
| P 17           | 11.4                             | 17.0 **  | 7.7      | 6.1      | 25.9 *** | 7.9      | 16.9 **  |
| P 27           | 8.2                              | 7.3      | 0.9      | 0.0      | 12.0     | 0.3      | 7.2      |

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note. The comparisons were done using the adjectives listed for the individual emotion scale  
 Note. The results of the games: Game 1 (Finland-England 2-0), Game 2 (Finland-Sweden 1-4),  
 Game 3 (Finland-Scotland 1-0), Game 4 (Finland-San Marino 4-0)

### Within-group comparisons

The within-group medians of the players' situational intensity medians of each emotion category (m P+, m N+, m P-, m N-, m P+N+, m P-N-, m P+N+P-N-, see

chapter 5.4) across the whole sample are reported in Table 17. As the table shows, for the first game the situational intensities of positive optimal (P+) emotions were typically at the higher level just before (9) and in all the during-game parts (from 7 to 8) than 24 hours before (5) or 30 minutes after (2) the games. Consistent findings were found for the negative optimal (N+) emotions. On the contrary, the situational intensities of the dysfunctional emotions (P- and N-) were typically observed to be on a higher level 24 hours before and 30 minutes after the game than in all the during-game parts or just before performance. Similar observations were also found for the second, third, and fourth games. These findings indicate that emotions were experienced by players differently during preparation (before) and just after a game had ended than during the task execution. With regard to optimal emotions, these observations seem to share some similarities with those found in exploring the temporal patterns of pre- and post-competition state anxiety (see e.g. Cox, 1994, for a review).

It is also noteworthy that the P- emotions seem to have rather high intensities during pre-game preparation and post-game recovery, while the intensities of the N- emotions were observed to be at relatively low level in all the situations. This observation indicates that even though the P- emotions have harmful effects on during-game performance, they could have helpful effects on preparation and recovery. On the other hand, the post-game measurements could also be as reflecting the game results (e.g. see the difference between the second game and the others).

The situational emotion intensities were further compared across the measurements using the Friedman's two-way analysis of variance by ranks (see Table 17). The results show that intensities changed significantly in 71 % of all cases. The P+, P+N+, and P-N- emotions were observed to vary significantly in all the games. However, a non-significant variance was found for the total emotion category (P+N+P-N-). The results show that emotions change over time also at the group level. This finding suggests that players had similar emotion patterns for the most of the emotion categories. However, the crucial role of the P+ emotions was again noticed.

In addition, the impact of performance level on the situational emotion patterns was examined using the Spearman rank-order coefficient correlation ( $r_s$ ). The Friedman's chi-square calculations, indicating the intraindividual variations of the situational intensities across the seven measurements (see Table 16), were contrasted with the players' performance ratio for all the emotion categories separately. The pre- and post-game emotion variations were contrasted with the total performance ratio, while the during-game variations were compare with the partial performance ratios. A positive correlation was found only in the N+ category (N of cases = 34,  $r_s = 0.34$ ,  $p < 0.05$ ), while for the other emotion categories the correlation coefficients were non-significant. The finding proposes that greater the variance was in negative helpful emotions the better was performance. It seems that negative helpful emotions are important part of successful performance, for instance, in generating enough energy for execution of the task (see chapter 6.4.2).

TABLE 17 The within-group levels (median) of the players' emotion intensity medians of each emotion category in the seven situations and four games (Friedman test)

| Game            | Task-related situation    |                     |                       |                        |                        |                        |                        | Friedman test $\chi^2$ |                      |
|-----------------|---------------------------|---------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|----------------------|
|                 | Emotion intensity medians | current 24 h before | predicted just before | recalled during 1/1 ht | recalled during 2/1 ht | recalled during 1/2 ht | recalled during 2/2 ht |                        | current 30 min after |
| Game 1 (n = 5)  |                           |                     |                       |                        |                        |                        |                        |                        |                      |
| m P+            | 5.0                       | 9.0                 | 8.0                   | 7.0                    | 7.0                    | 7.0                    | 7.0                    | 2.0                    | 14.9 *               |
| m N+            | 2.0                       | 5.8                 | 5.0                   | 4.5                    | 5.0                    | 3.3                    | 0.0                    | 0.0                    | 10.6                 |
| m P-            | 8.0                       | 2.0                 | 1.8                   | 2.0                    | 3.0                    | 3.0                    | 6.0                    | 6.0                    | 8.6                  |
| m N-            | 1.0                       | 0.5                 | 0.5                   | 0.0                    | 0.0                    | 0.0                    | 0.0                    | 0.8                    | 4.5                  |
| m P+N+          | 3.5                       | 7.0                 | 7.0                   | 6.0                    | 6.5                    | 6.0                    | 1.0                    | 1.0                    | 13.8 *               |
| m P-N-          | 7.5                       | 1.0                 | 0.5                   | 1.0                    | 1.0                    | 1.0                    | 5.0                    | 5.0                    | 15.0 *               |
| m P+N+P-N-      | 4.0                       | 4.0                 | 3.0                   | 3.5                    | 3.0                    | 2.0                    | 2.0                    | 2.0                    | 9.0                  |
| Game 2 (n = 9)  |                           |                     |                       |                        |                        |                        |                        |                        |                      |
| m P+            | 5.0                       | 7.5                 | 6.5                   | 6.5                    | 7.0                    | 3.5                    | 1.5                    | 1.5                    | 34.6 ***             |
| m N+            | 2.3                       | 5.0                 | 3.5                   | 3.5                    | 4.5                    | 5.0                    | 4.5                    | 4.5                    | 17.6 **              |
| m P-            | 4.0                       | 1.5                 | 1.0                   | 1.5                    | 1.8                    | 1.0                    | 2.0                    | 2.0                    | 21.6 **              |
| m N-            | 2.0                       | 0.5                 | 0.5                   | 1.0                    | 0.8                    | 2.0                    | 2.5                    | 2.5                    | 21.6 **              |
| m P+N+          | 3.5                       | 6.0                 | 6.0                   | 5.0                    | 5.5                    | 4.0                    | 2.5                    | 2.5                    | 21.6 **              |
| m P-N-          | 2.5                       | 0.8                 | 1.0                   | 1.5                    | 1.5                    | 2.0                    | 3.0                    | 3.0                    | 20.1 **              |
| m P+N+P-N-      | 3.0                       | 3.0                 | 3.0                   | 3.0                    | 3.0                    | 3.0                    | 3.0                    | 3.0                    | 4.3                  |
| Game 3 (n = 10) |                           |                     |                       |                        |                        |                        |                        |                        |                      |
| m P+            | 5.3                       | 6.3                 | 7.3                   | 7.5                    | 7.5                    | 7.3                    | 2.0                    | 2.0                    | 22.4 **              |
| m N+            | 2.5                       | 5.0                 | 4.8                   | 4.3                    | 3.4                    | 3.5                    | 1.4                    | 1.4                    | 24.2 ***             |
| m P-            | 3.4                       | 1.1                 | 0.8                   | 0.9                    | 1.0                    | 1.1                    | 4.0                    | 4.0                    | 15.8 *               |
| m N-            | 1.0                       | 0.8                 | 1.0                   | 0.9                    | 1.1                    | 0.8                    | 1.3                    | 1.3                    | 7.0                  |
| m P+N+          | 3.8                       | 5.5                 | 6.1                   | 6.0                    | 6.1                    | 6.0                    | 1.2                    | 1.2                    | 26.4 ***             |
| m P-N-          | 2.0                       | 0.9                 | 0.9                   | 0.9                    | 1.3                    | 1.0                    | 2.5                    | 2.5                    | 24.0 ***             |
| m P+N+P-N-      | 3.0                       | 3.0                 | 3.5                   | 3.0                    | 3.3                    | 2.8                    | 2.5                    | 2.5                    | 5.3                  |
| Game 4 (n = 10) |                           |                     |                       |                        |                        |                        |                        |                        |                      |
| m P+            | 5.8                       | 7.8                 | 7.5                   | 7.3                    | 6.5                    | 6.3                    | 3.0                    | 3.0                    | 39.1 ***             |
| m N+            | 2.3                       | 3.8                 | 2.5                   | 2.3                    | 2.3                    | 2.0                    | 0.8                    | 0.8                    | 19.2 **              |
| m P-            | 3.3                       | 1.1                 | 1.3                   | 1.3                    | 2.5                    | 2.0                    | 4.0                    | 4.0                    | 18.9 **              |
| m N-            | 1.8                       | 0.5                 | 0.5                   | 0.2                    | 0.5                    | 0.8                    | 1.3                    | 1.3                    | 19.9 **              |
| m P+N+          | 4.8                       | 6.0                 | 5.5                   | 4.4                    | 4.0                    | 4.4                    | 1.5                    | 1.5                    | 25.5 ***             |
| m P-N-          | 2.0                       | 0.5                 | 0.7                   | 0.8                    | 0.9                    | 1.0                    | 2.5                    | 2.5                    | 29.6 ***             |
| m P+N+P-N-      | 3.0                       | 1.8                 | 2.0                   | 2.0                    | 2.0                    | 2.5                    | 1.9                    | 1.9                    | 7.2                  |

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note. The within-group medians were calculated using the intraindividual intensity medians of each emotion category: m P+, m N+, m P-, m N-, m P+N+, m P-N-, and m P+N+P-N-  
 Note. The results of the games: Game 1 (Finland-England 2-0), Game 2 (Finland-Sweden 1-4), Game 3 (Finland-Scotland 1-0), Game 4 (Finland-San Marino 4-0)

### 6.3.1 Summary and interpretation

Emotions have not been studied in a real-life setting with measurements followed from 24 hours before through four during-game parts to 30 minutes after the game. The results indicated that emotions described for the positive



optimal category are the most critical for performance. These emotions had the highest intensity and they varied most strongly during the time interval. For the negative dysfunctional emotions the lowest intensity levels and the least significant variation were observed across the situations. This finding indicates that these emotions are always dysfunctional for players and they affect performance only occasionally. Positive dysfunctional and negative optimal emotions were observed usually at fairly moderate intensity levels and variations. However, before (preparation) and after (recovery) games positive dysfunctional emotions seems to have helpful impacts on players. This finding suggests that there may be the need to develop individualised emotion scales to indicate pre-game emotions, relevant for preparation, during-game emotions, relevant for playing, and post-game emotions, relevant for recovery, separately.

The results also showed that for all the players emotions varied during the time interval from pre-game to post-game. This observation was found in both the intraindividual and group level analyses. The results indicated that emotions varied in all the four categories, but more frequently in the optimal categories (positive 68 % and negative 47 %) than dysfunctional (38 % and 26 %, respectively). It was also noticed that the adjectives of the individual scales never all change at the same time. This finding suggests that for each player a certain emotion descriptions were more relevant for performance than others. In future studies, the importance of emotions should be added to the instructions used within the individualised emotion profiling procedure in order to explore these key emotions. On the other hand, these findings indicate that situational emotions are also included in the emotion lists. In other words, some emotions, such as angry, may not be relevant for performance throughout the match. It may appear, for instance, after a critical episode such as a referee's mistake. Or that some emotions, especially in the P+ category, are experienced and changed by players all the time. Such emotions as energetic and motivated are likely examples.

The inter-individual comparisons further indicated that emotion variation was different between the players. For some players, emotions remained relatively stable throughout the game, while for others the variation was quite considerable. Furthermore, the performance effect on emotion variation was examined. A significant positive correlation was only found for N+ emotions between the amount of variation and the performance ratio. The result suggests that the more the N+ adjectives varied the better was the performance. This finding indicates that these reversal emotions have an important role on how a player is performing. However, the result could also indicate that these feelings have harmful effects for a player in early preparation, or they could reflect a poor game result.

In general, the stability or instability of emotions observed for some of the players in the present study may have occurred for a variety reasons, such as changes in the energy level of the body (somatic reactions), ability to concentrate (cognition), state of motivation, current game situations (winning or losing), or personal, teammate's or opponent's success in play. The variations may also reflect, for instance, opponents' skill, referee's mistake, or conditions such as the weather. The findings support Lazarus's (1991) idea that emotions

are the result of a constantly changing person-environment relationship. On the other hand, the stability of emotions observed for some of the players may be the result of, for instance, individually effective coping abilities, clear and high goals in playing, or the easiness of a task for that person.

## **6.4 Emotion-performance relationship**

The aim of the following investigation was to explore the effect of emotion upon soccer performance. A key issue was to test the assumptions of the in-out of the zone principle proposed within the framework of the IZOF model. Another topic was to examine the functional meaning of the impact of emotion on performance using 17 players' qualitative, verbal statements indicating why and how emotions are helpful or harmful to them.

### **6.4.1 In-out of the zone principle**

The predictive validity of the in-out of the zone principle was tested using 22 players' a) optimal and dysfunctional zones, b) predicted, current, and recalled situational emotion measurements in four international games, and c) self-rated performance ratios from the games. Self-rated performance scores using values 8, 9, 10 (extremely successful), and # (excellent) on Borg's scale were assigned to a successful performance group, whereas the scores 0, 0.5 (extremely poor), 1 (very poor), 2 (poor), and 3 (below average) were assigned to a poor performance group. The value 3 (below average) was classified in the poor group because without it there would not be enough cases for statistical analysis. The average performance group, denoted by the values 4, 5, and 6, were not used in the following analyses, except in few illustrative cases. For the pre- and post-game analysis the total self-rated performance level was used, while for the during-game analyses the partial performance ratios were used (see chapter 5.2).

The in-out of the zone principle was examined at the intraindividual, within-group, and inter-group levels. The intraindividual examination was limited to the descriptions of the emotion patterns in successful, average, and poor performance without statistical analysis, because very few of the players had enough self-ratings in each performance group (see Appendix 6). At the group level, the principle was tested by examining both the separate and joint effects of optimal and dysfunctional emotions upon performance within and between successful and poor performance groups.

#### **Intraindividual emotion patterns in successful, average, and poor performance**

To give an example, one player's during-game emotion patterns in the successful (7-10), average (4-6), and poor (0-3) performance groups are

illustrated in Figure 8. For this particular player, the in-out of the zone principle seems to work fairly well.

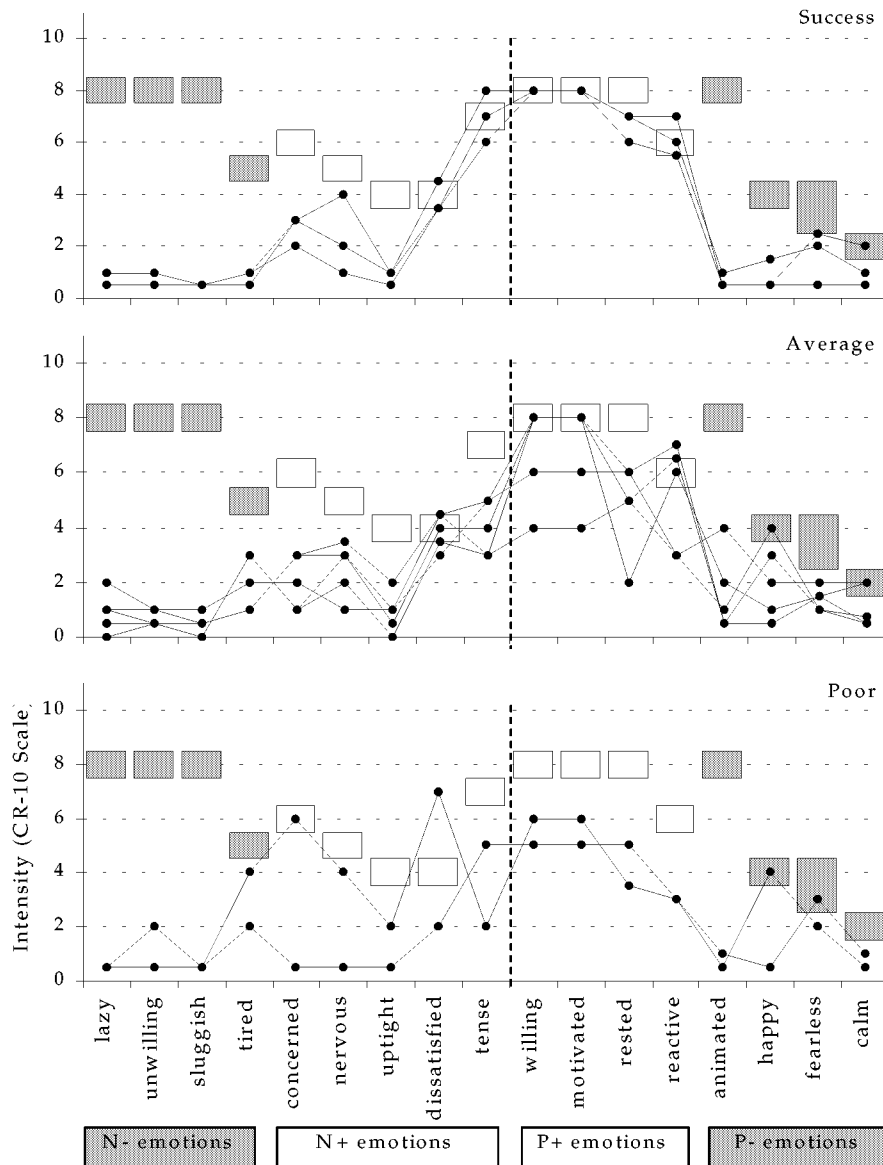


FIGURE 8 Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 20* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)

As seen in Figure 8, in *successful performance* the player's emotion intensities were close or within his optimal zones for 6 adjectives out of 9. However, the intensities of the emotions "concerned" and "nervous" were not very close to these zones. For dysfunctional emotions his intensities were a long way from the areas for 6 adjectives out of 8. The emotion patterns for successful performance seem to follow the IZOF predictions. In *average performance* the optimal emotions were more frequently outside the zones and dysfunctional emotions were more often closer to the zones than in successful performance. In *poor performance* only one emotion, "concerned", was observed to be within the optimal zone and rest of the adjectives was found to be outside the optimal area. Dysfunctional emotions, however, were found to be rather similarly located than to those in average and successful performance. It was also observed that the emotion patterns for several words e.g. lazy, sluggish, tight, and calm, were relatively stable for all the performance groups.

These observations indicate that for this particular player the emotion patterns in successful, average and poor performance were quite different. However, it seems that the optimal emotions (P+ and N+) are more critical for performance than the dysfunctional emotions (P- and N-). The findings also show that there are certain key emotions which determine the level of performance. This observation, again (see chapter 6.3.1 for a discussion), suggests that the importance of emotion descriptors should be indicated in future studies. As an additional illustration, the emotion patterns of all the players who had measurements within all three performance groups are presented in Appendix 12.

### **The separate effect of optimal and dysfunctional emotions**

Optimal (P+, N+, and P+N+) and dysfunctional (P-, N-, and P-N-) emotions were separately examined by comparing each player's predicted, current, and recalled intensities to his optimal and dysfunctional zones. This comparison was performed using three categories: within or close to the zone, above the zone, and below the zone. The first category (within) included all the adjectives in which the situational intensities were inside or close ( $\pm 1$ ) to the zones (less than one standard error on the CR-10 scale). The second category (above) contained all the emotions in which the situational intensities were above the zones (difference > than +1), and the third category (below) all the intensities that were found below the areas (difference < than -1). Each players' frequencies in these three categories (within, above, and below) were then contrasted within two performance groups: successful (7-10 scores on Borg's scale) and poor (0-3). Within-group means and standard deviations of the frequencies are reported for successful performance in Table 18 and for poor performance in Table 19. The difference in the frequencies between within (in) and outside (out = sum of the above and below frequencies) were analysed using the Sign test. Furthermore, the relationship between the frequencies and performance level was analysed by calculating the correlation coefficients across the whole sample.

TABLE 18 The within-group mean (M) and standard deviation (SD) of the frequencies of task-related emotion intensities observed within (or close to) and outside, either above or below, the zones before, during, and after *successful* (7-10 scores at the Borg's scale) *performance*

| Situation<br>Emotion<br>deviation      | Frequencies in successful performance (%) |                 |                 | In-Out<br>difference<br>Sign-test |
|--|---|-----------------|-----------------|-----------------------------------|
|  | Within (or close)<br>M ± SD               | Above<br>M ± SD | Below<br>M ± SD |                                   |
| 24 hours before (n <sub>1</sub> )      |   |                 |                 |                                   |
| d P+                                   | 40 ± 34                                   | 13 ± 17         | 47 ± 39         | ns                                |
| d N+                                   | 43 ± 31                                   | 3 ± 10          | 55 ± 35         | ns                                |
| d P+N+                                 | 41 ± 26                                   | 8 ± 10          | 51 ± 32         | ns                                |
| d P-                                   | 34 ± 39 <sup>02</sup>                     | 22 ± 34         | 44 ± 44         | ns                                |
| d N-                                   | 14 ± 20 <sup>02</sup>                     | 4 ± 9           | 82 ± 22         | **                                |
| d P-N-                                 | 25 ± 22 <sup>02</sup>                     | 12 ± 14         | 63 ± 26         | ns                                |
| Just before (n <sub>1</sub> )          |   |                 |                 |                                   |
| d P+                                   | 68 ± 31 <sup>02</sup>                     | 20 ± 31         | 13 ± 18         | ns                                |
| d N+                                   | 46 ± 35                                   | 34 ± 36         | 20 ± 33         | ns                                |
| d P+N+                                 | 57 ± 23 <sup>02</sup>                     | 26 ± 29         | 17 ± 17         | ns                                |
| d P-                                   | 16 ± 31 <sup>02</sup>                     | 4 ± 14          | 80 ± 38         | *                                 |
| d N-                                   | 7 ± 18 <sup>02</sup>                      | 0 ± 0           | 93 ± 18         | **                                |
| d P-N-                                 | 11 ± 16 <sup>02</sup>                     | 2 ± 6           | 87 ± 18         | ***                               |
| During (n <sub>2</sub> ) <sup>01</sup> |   |                 |                 |                                   |
| d P+                                   | 60 ± 27 <sup>02</sup>                     | 22 ± 24         | 18 ± 22         | *                                 |
| d N+                                   | 40 ± 30                                   | 25 ± 32         | 35 ± 33         | *                                 |
| d P+N+                                 | 50 ± 20                                   | 24 ± 24         | 26 ± 21         | ns                                |
| d P-                                   | 20 ± 28 <sup>02</sup>                     | 8 ± 20          | 72 ± 39         | ***                               |
| d N-                                   | 10 ± 16 <sup>02</sup>                     | 0 ± 0           | 90 ± 16         | ***                               |
| d P-N-                                 | 15 ± 15 <sup>02</sup>                     | 4 ± 9           | 82 ± 19         | ***                               |
| 30 minutes after (n <sub>1</sub> )     |   |                 |                 |                                   |
| d P+                                   | 32 ± 35                                   | 5 ± 13          | 63 ± 32         | ns                                |
| d N+                                   | 19 ± 24                                   | 0 ± 0           | 81 ± 24         | *                                 |
| d P+N+                                 | 26 ± 29                                   | 3 ± 7           | 71 ± 27         | *                                 |
| d P-                                   | 27 ± 32 <sup>02</sup>                     | 36 ± 41         | 37 ± 35         | ns                                |
| d N-                                   | 25 ± 32 <sup>02</sup>                     | 5 ± 10          | 70 ± 32         | ns                                |
| d P-N-                                 | 27 ± 23 <sup>02</sup>                     | 19 ± 19         | 54 ± 28         | *                                 |

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, ns = non-significant

n<sub>1</sub> = 12 cases, n<sub>2</sub> = 47 cases

<sup>01</sup> - During-game situations (1/1 ht, 2/1 ht, 1/2 ht, and 2/2 ht) were analysed together

<sup>02</sup> - The "in-out" frequencies followed the predictions of the in-out of the zone principle

Note. Each case contains one player's frequencies of emotion deviations in one situation

Note. Deviation between situational emotions intensity and individual zones:

Within = Situational scores within or close to the zones (difference in matched-pairs zero or ± 1)

Above = Situational scores above the zones (difference in matched-pairs > than +1)

Below = Situational scores below the zones (difference in matched-pairs < than -1)

Note. For pre- and post-game measurements the total self-rated performance level was used.

For during-game measurements the self-rated partial performance levels were used.

*Successful performance.* According to the in-out of the zone principle, a successful performance should be observed when a player's situational intensities are within or close to his optimal zones and outside his dysfunctional zones. As seen from Table 18, during-game frequencies were as predicted in the P+ and in all dysfunctional (P-, N-, and P-N-) categories, and the in-out differences were significant. For the P+ emotions 60 % of observations were found within or close to the zones, 22 % of observations above and 18 % below these areas. Conversely, for the dysfunctional emotions, most of the observations were found outside the zones, either above (P- 8 %) or below (P- 72 % and N- 90 %) and in only a few cases were within or close to the zones (P- 20 % and N- 10 %). The optimal negative emotions, however, did not follow the assumptions of the principle. Regarding the just before performance (predicted) measurements, the frequencies of the P+ and joint P+N+ categories and in all the dysfunctional categories also followed the assumptions of the in-out hypothesis. However, the in-out difference was found to be significant only for dysfunctional emotions. For the P+ emotions an almost significant difference ( $p = 0.07$ ) was observed. Nevertheless, with regard to just before and during-game situations, these findings provide fairly good support for the in-out of the zone principle in all the other emotion categories except the N+ category.

The case was quite different with emotions 24 hours before and 30 minutes after the game. In both situations dysfunctional emotions, again, were as assumed. However, significant differences between the frequencies were found only for the N- emotions 24 hours before and for the joint P-N- category 30 minutes after performance. It was also found that in these situations positive dysfunctional emotions were more frequently above the zones (before 22 % and after 36 %) than they were just before (4 %) and during (8 %) the game. The optimal emotions did not follow the predictions. In all cases these emotions were observed more often to lie outside the zones than inside. The difference between these unexpected in-out frequencies was significant for the N+ and joint P+N+ emotions 30 minutes after the game. These findings suggest that during early-preparation it is more advantageous to be outside all the zones, both optimal and dysfunctional, for performance to be successful. It also seems that just after a game has ended, players "fall" from their effective emotional states. From a practical point of view, the ability to switch from out to in and again to out might be the key element in players enhancing their performance.

*Poor performance.* The in-out of the zone principle predicts that for poor performance a player should be outside his optimal zones and within his dysfunctional zones. As seen in Table 19, the principle was only partially supported. For optimal emotions the frequencies were as predicted, more often out than in, in all four situations except for the N+ emotions just before the game. However, the in-out difference was non-significant in all the other cases, except for the P+ and joint P+N+ emotions in the post-game measurements. On the contrary, the frequencies of the dysfunctional adjectives were not as predicted (more often out than in) in any of the emotion categories and situations, while the in-out difference were significant, except for the P- 24 hours before, and just before, and N- and P-N- categories 30 minutes after the

game. These results could be explained from several perspectives (see chapter 6.4.3 for a discussion).

TABLE 19 The within-group mean (M) and standard deviation (SD) of the frequencies of task-related emotion intensities observed within (or close to) and outside, either above or below, the zones before, during, and after *poor* (0-3 scores at the Borg's scale) performance

| Situation<br>Emotion<br>deviation      | Frequencies in poor performance (%) |                 |                 | In-Out<br>difference<br>Sign-test |
|--|-------------------------------------|-----------------|-----------------|-----------------------------------|
|  | Within (or close)<br>M ± SD         | Above<br>M ± SD | Below<br>M ± SD |                                   |
| 24 hours before (n <sub>1</sub> )      |                                     |                 |                 |                                   |
| d P+                                   | 30 ± 28 <sup>02</sup>               | 8 ± 18          | 62 ± 26         | ns                                |
| d N+                                   | 39 ± 38 <sup>02</sup>               | 13 ± 26         | 48 ± 47         | ns                                |
| d P+N+                                 | 33 ± 28 <sup>02</sup>               | 10 ± 17         | 58 ± 28         | ns                                |
| d P-                                   | 25 ± 28                             | 21 ± 33         | 55 ± 41         | ns                                |
| d N-                                   | 12 ± 15                             | 3 ± 8           | 85 ± 20         | **                                |
| d P-N-                                 | 18 ± 14                             | 10 ± 14         | 72 ± 24         | **                                |
| Just before (n <sub>1</sub> )          |                                     |                 |                 |                                   |
| d P+                                   | 42 ± 18 <sup>02</sup>               | 22 ± 22         | 37 ± 27         | ns                                |
| d N+                                   | 54 ± 35                             | 35 ± 40         | 11 ± 23         | ns                                |
| d P+N+                                 | 44 ± 13 <sup>02</sup>               | 30 ± 27         | 26 ± 21         | ns                                |
| d P-                                   | 24 ± 34                             | 7 ± 15          | 69 ± 39         | ns                                |
| d N-                                   | 4 ± 11                              | 0 ± 0           | 96 ± 11         | **                                |
| d P-N-                                 | 13 ± 17                             | 2 ± 5           | 85 ± 19         | **                                |
| During (n <sub>2</sub> ) <sup>01</sup> |                                     |                 |                 |                                   |
| d P+                                   | 42 ± 29 <sup>02</sup>               | 8 ± 13          | 50 ± 32         | ns                                |
| d N+                                   | 46 ± 37 <sup>02</sup>               | 20 ± 29         | 34 ± 39         | ns                                |
| d P+N+                                 | 42 ± 27 <sup>02</sup>               | 14 ± 17         | 44 ± 31         | ns                                |
| d P-                                   | 26 ± 25                             | 9 ± 15          | 65 ± 33         | ***                               |
| d N-                                   | 11 ± 15                             | 3 ± 12          | 86 ± 21         | ***                               |
| d P-N-                                 | 18 ± 15                             | 5 ± 9           | 77 ± 20         | ***                               |
| 30 minutes after (n <sub>1</sub> )     |                                     |                 |                 |                                   |
| d P+                                   | 14 ± 20 <sup>02</sup>               | 2 ± 7           | 84 ± 22         | *                                 |
| d N+                                   | 28 ± 25 <sup>02</sup>               | 30 ± 32         | 42 ± 37         | ns                                |
| d P+N+                                 | 21 ± 16 <sup>02</sup>               | 13 ± 14         | 66 ± 20         | *                                 |
| d P-                                   | 21 ± 33                             | 10 ± 15         | 69 ± 39         | *                                 |
| d N-                                   | 24 ± 36                             | 16 ± 33         | 60 ± 43         | ns                                |
| d P-N-                                 | 22 ± 29                             | 15 ± 25         | 63 ± 35         | ns                                |

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, ns = non-significant

n<sub>1</sub> = 9 cases, n<sub>2</sub> = 28 cases

<sup>01</sup> - During-game situations (1/1 ht, 2/1 ht, 1/2 ht, and 2/2 ht) were analysed together

<sup>02</sup> - The "in-out" frequencies followed the predictions of the in-out of the zone principle

Note. Each case contains one player's frequencies of emotion deviations in one situation

Note. Deviation between situational emotions intensity and individual zones:

Within = Situational scores within or close to the zones (difference in matched-pairs zero or ± 1)

Above = Situational scores above the zones (difference in matched-pairs > than +1)

Below = Situational scores below the zones (difference in matched-pairs < than -1)

Note. For pre- and post-game measurements the total self-rated performance level was used.

For during-game measurements the self-rated partial performance levels were used.

*Success versus poor comparisons.* The frequencies of within, above, and below the zones, including the whole sample, were contrasted with players' self-rated performance ratios (not groups) using the Spearman rank-order correlation coefficient ( $r_s$ ) (Table 20). The non-significant correlation coefficients were revealed for all the within observations. However, an almost significant positive correlation was found for the P+ emotions just before ( $r_s = 0.25$ ,  $p = 0.07$ ) and during ( $r_s = 0.14$ ,  $p = 0.06$ ) the games. This observation indicates that more the players' P+ adjectives were within the zones during or just before the games, the better their performance. The finding supports the in-out of the zone principle. A positive correlation was, however, also found with during-game P+ emotions for the above observations ( $r_s = 0.28$ ,  $p < 0.001$ ), while a negative correlation emerged for the below observations ( $r_s = 0.40$ ,  $p < 0.001$ ). Similar results were found for the joint P+N+ emotions and also for the N- emotions regarding the below observations. This result suggests that for his performance it is more harmful for a player to be below than above his individual zones. In fact, being above the zones may just be less effective or helpful for a player, but not harmful. The finding, again (see chapter 6.2.1), suggests that the instructions used within the individualised emotion profiling procedure need further extension. For future studies, it seems that the impact of an emotion should be identified for a whole range of intensities from nothing at all to the maximum possible.

Furthermore, the outside observations, both above and below, for the P- and N+ emotions were found to correlate with performance significantly 30 minutes after the game. A positive correlation was observed for the below observations of the negative emotions ( $r_s = 0.36$ ,  $p < 0.01$ ) and for the above observations of the positive emotions ( $r_s = 0.31$ ,  $p < 0.05$ ). A negative correlation, instead, was revealed for above observations of positive and below observations of negative emotions. The influence of the game result on emotions might explain these findings.



TABLE 20 The correlation coefficients (Spearman) between frequencies of task-related emotion intensities observed within or close to, above, or below the zones and self-rated performance ratios (n = 22 players)

| Emotion deviation<br>Situational intensity<br>vs. intensity zones | 24 hours<br>before<br>cases = 57 | Predicted<br>just before<br>cases = 56 | During <sup>1)</sup><br>(four parts)<br>cases =176 | 30 minutes<br>after<br>cases = 57 |
|---|----------------------------------|--|--|-----------------------------------|
| d P+  |                                  |  |  |                                   |
| Within  | 0.10                             | 0.25                                   | 0.14   | 0.19                              |
| Above   | 0.19                             | -0.03                                  | 0.28 ***   | 0.15                              |
| Below   | -0.23                            | -0.28 *                                | -0.40 ***  | -0.35 **                          |
| d N+  |                                  |  |  |                                   |
| Within  | 0.16                             | 0.03                                   | -0.05  | -0.20                             |
| Above   | -0.13                            | 0.10                                   | 0.14   | -0.37 **                          |
| Below   | 0.02                             | 0.04                                   | 0.02   | 0.36 **                           |
| d P+N+  |                                  |  |  |                                   |
| Within  | 0.16                             | 0.16                                   | 0.05   | 0.01                              |
| Above   | 0.10                             | 0.03                                   | 0.20 **  | -0.21                             |
| Below   | -0.09                            | -0.17                                  | -0.21 **   | 0.10                              |
| d P-  |                                  |  |  |                                   |
| Within  | 0.08                             | -0.02                                  | -0.07  | 0.13                              |
| Above   | 0.13                             | 0.09                                   | 0.03   | 0.31 *                            |
| Below   | -0.14                            | 0.07                                   | 0.06   | -0.31 *                           |
| d N-  |                                  |  |  |                                   |
| Within  | 0.07                             | 0.09                                   | -0.03  | 0.00                              |
| Above   | 0.05                             | no obs.                                | -0.16 *  | -0.05                             |
| Below   | -0.15                            | -0.12                                  | -0.08  | -0.01                             |
| d P-N-  |                                  |  |  |                                   |
| Within  | 0.14                             | 0.07                                   | -0.08  | 0.15                              |
| Above   | 0.16                             | 0.09                                   | 0.01   | 0.17                              |
| Below   | -0.17                            | -0.03                                  | 0.02   | -0.24                             |

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

<sup>1)</sup> - During-game situations (1/1 ht, 2/1 ht, 1/2 ht, and 2/2 ht) were analysed together

Note. Deviation between situational emotions intensity and individual zones:

Within = Situational scores within or close to the zones (difference in matched-pairs zero or  $\pm 1$ )

Above = Situational scores above the zones (difference in matched-pairs > than +1)

Below = Situational scores below the zones (difference in matched-pairs < than -1)

Note. For pre- and post-game measurements the total self-rated performance level was used.

For during-game measurement the self-rated partial performance levels were used.

### The joint effect of optimal and dysfunctional emotions

According to Hanin (1997a) optimal and dysfunctional emotions separately may not be sufficient predictors for performance. Therefore, these emotions should be studied simultaneously. Following this notion, optimal and dysfunctional emotions were combined using deviations (absolute) of each player's predicted, current, and recalled intensities from his optimal and dysfunctional zones. If deviation is zero, then the situational emotions are within the zones.

The joint effect of optimal and dysfunctional emotions was, first, illustrated by contrasting the P+N+ emotion deviations with the P-N-

deviations separately in successful (7-10), average (4-6), and poor (0-3) performance. As an illustration, the during-game emotion deviations of the joint optimal (P+N+) and dysfunctional (P-N-) emotions are presented in Figure 9. The size of the circles denotes the level of the standard deviation. Following the in-out hypothesis, in successful performance the deviations of optimal emotions should be close to zero and, simultaneously, the deviations of dysfunctional emotions should be observed far from zero (upper left-hand corner of the figure). Conversely, for poor performance, the emotion deviations should be far from zero for optimal and close to zero for dysfunctional adjectives (lower right-hand corner of the figure). Average performance, following the IZOF assumptions, should be when both optimal (P+N+) and dysfunctional (P-N-) emotion deviations are either close to zero (lower left-hand corner) or far away from zero (upper right-hand corner).

As seen in Figure 9, the directions of emotion deviations between successful and poor performance were as expected. The deviations of successful performance were observed to be closer to the upper left-hand corner than the deviations of poor performance. The emotion deviations in the average performance group seem to follow the within-zone principle. The description supports the in-out of the zone principle. However, the differences between the performance groups are not very notable.

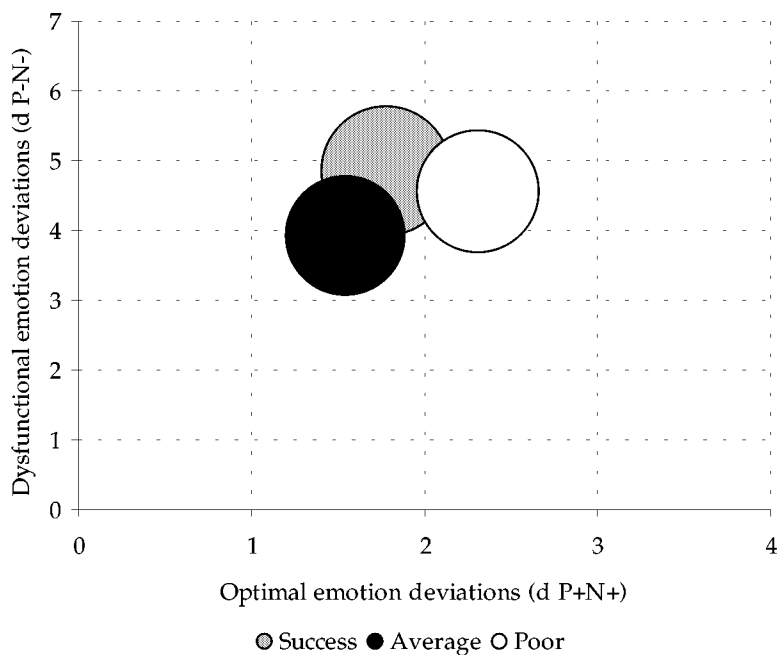


FIGURE 9 The joint effect of the optimal (d P+N+) and dysfunctional (d P-N-) during-game emotion deviations (absolute) in successful (7-10), average (4-6), and poor (0-3) performance groups (size of the circle denotes the level of the standard deviation; in the successful performance group  $n = 47$  cases, in the average performance group  $n = 101$  cases, and in the poor performance group  $n = 28$  cases; the self-rated partial performance levels were used)

The joint emotion effect on performance was also examined by combining the emotion deviations of the optimal and dysfunctional emotions. This was calculated by subtracting each players' P+ and N+ emotion deviations from their P- and N- emotion deviations:  $[d(P-) + d(N-)] - [d(P+) + d(N+)]$ . Thus, the bigger the value the better should be the performance.

The combined during-game emotion deviations and the level of performance are presented across the whole sample, as an illustration, in Figure 10. The Spearman Rank-Order Correlation Coefficient ( $r_s$ ) was calculated for examining this relationship. A low significant positive correlation was found between during-game emotion deviations and performance ( $r_s = 0.16$ ,  $p < 0.05$ ). However, for the pre- and post-game situations the correlation coefficients were observed to be non-significant. In addition, the difference in the combined deviations between successful (7-10) and poor (0-3) performances were analysed using the Mann-Whitney test. The during-game emotion deviations were found the significantly different ( $Z = -2.3$ ,  $p < 0.05$ ) between the successful (mean emotion deviation = 6.2) and poor (4.5) performance groups. For the other situations (24 h before, just before, and after) a non-significant difference was observed.

These results provide support for the in-out of the zone principle regarding during-performance observations, but not for the situations before and after the game. However, on the basis of these results Hanin's (1997a) notion of the joint effect of optimal and dysfunctional emotions as a better predictor of performance than the effect of these emotions separately, remains questionable, and needs further clarification. The issue should be studied emphasising intraindividual level comparisons, which were not performed in the present investigation.

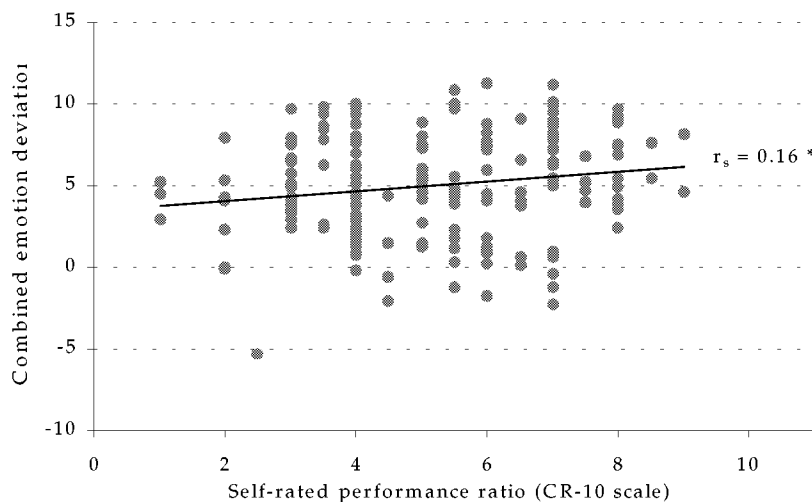


FIGURE 10 The combined during-game optimal and dysfunctional emotion deviations and performance ratios across the whole sample ( $n = 176$  cases and 22 players; black line presents a trend line;  $r_s$  = Spearman correlation; emotion deviations were combined using the formula:  $[d(P+) + d(N+)] - [d(P-) + d(N-)]$ ; the self-rated partial performance levels was used)

### 6.4.2 The functional meaning of the impact of emotion on performance

The purpose here was to describe the players' functional interpretation of the impact of emotion on performance. This question was briefly analysed with 17 players' answers to the open-ended questions about why and how optimal emotions are helpful and dysfunctional emotions are harmful to them (Appendixes 13 to 16). The statements will first be analysed to see if the four functions proposed to exist within the construct of energy utilization and mobilization (see chapter 3.1) could be found in the players' answers. Then, few considerable notions regarding the functional meanings of emotions will be demonstrated.

The construct of energy utilization and mobilization, presented as a basic assumption of the IZOF model, consists of four different functions: a) an energizing or energy mobilizing function (M+); b) an energy de-mobilizing function

(M-); c) an energy utilization or regulation function (U+); and d) an energy misuse or de-regulation function (U-). These four functions were quite easily identifiable from the players' answers. For the optimal emotions (P+ and N+), the answers were found to refer to the energy utilization or regulation function (U+), for example:

"My concentration on the game is better." (P6: charged, P+);  
 "I have the strength to do more work at the field." (P8: rested, P+);  
 "If I'm resolute I dare to make decisions." (P58: resolute, P+);  
 "I dare to try things and do my own things." (P65: brave, P+);  
 "It makes me concentrate on every situation, I'm always ready." (P15: tense, N+);  
 "I'm in the game all the time, I don't lose my interest at all." (P53: passionate, N+); or  
 "Gives me power and properly channelled allows me to concentrate on what is relevant." (P19: irritated, N+).

The energy mobilization function (M+) can be seen in the following statements:

"Dissatisfaction gets my legs going." (P58: dissatisfied, N+);  
 "It gives me more power." (P8: tense, N+; P19: passionate, N+);  
 "It's the finishing touch before the game starts." (P6: reactive, P+);  
 "It increases aggressiveness → self-confidence (partly)." (P59: aggressive, N+); or  
 "It gives me a fighting spirit for the game." (P59: intense, N+).

For the dysfunctional emotions (P- and N-), the answers also very clearly referred to the factors of the construct. The energy misuse or de-regulation function (U-) is reflected in examples such as:

"I don't dare to go into situations." (P6: afraid (N-);  
 "I don't dare to make decisions." (P8: uncertain, N-);  
 "I take too many stupid risks." (P15: fearless, P-);  
 "Feeling too lively takes away from your concentration." (P57: animated, P-);  
 "You don't take the game seriously." (P65: carefree, P-); or  
 "When you are annoyed, you concentrate on all kinds of irrelevant things (such as blaming the referee)." (P32: annoyed, N-).

The energy de-mobilizing function (M-) is presented in the following answers:

“Feeling sluggish prevents you having the strength to play all out.” (P49: sluggish, N-)  
 “My body feels tired, I don’t have the strength to run.” (P53: tired, N-);  
 “I don’t have the strength to do the things with care.” (P57: tired, N-);  
 “I don’t have the strength to give it all I’ve got.” (P65: exhausted, N-); or  
 “If I’m not nervous / tense at all, my attitude to the game is too slack.” (P67: calm, P-).

The findings support the four-function classification of emotions and are consistent with earlier studies (Hanin, 1993; Hanin & Syrjä, 1995a).

The players’ answers to the open-ended questions also contained several additional notions that could be considered. For instance, several statements indicated that emotions interact; for example:

“Feeling dispirited may have a positive influence, if it takes away extra tension.” (P58: dispirited, N+);  
 “Being in too much of a good mood is bad, meaning that your attitude is too slack.” (P32: irritated, N+);  
 “It increases aggressiveness -> self-confidence (partly).” (P59: provoked, N+);  
 “I can play longer, I don’t think about being tired.” (P52, passionate, N+);  
 “To avoid feeling over-secure, I have to think about what I could do better.” (P30: dissatisfied, N+)  
 “So I don’t go into the game feeling too relaxed and confident.” (P67: tense, N+)

It seems that for some emotions the functional meaning is to make “room” for more crucial emotions for performance or to avoid the detrimental effects of other emotions. This ability was mainly observed in statements regarding negative optimal emotions (N+). These particular emotions could be classified into the energy utilization or regulation category (U+), although their functional abilities could be considered inter-relational.

It was also observed that emotions do not necessary have a direct influence on performance. In some cases emotions influence motivational factors or cognitive functions (such as concentration) and through them they can have an impact on performance, as in the statement (P19: irritated, N+): “Gives me power and properly channelled allows me to concentrate on what is relevant.” This sentence demonstrates that for this player the emotion “irritated” influences to the ability to concentrate, which might then enhance his performance. A similar idea was seen in several players’ answers (e.g. P48: carefree, P+; P6: charged, P+; P15 and P48: tense, N+). The role of this mediating process merits further study.

Nevertheless, these results provide support for the construct of energy utilization and mobilization as a primary functional interpretation of the impact of emotion on performance.

#### 6.4.3 Summary and interpretation

Consistent with the earlier investigations (Syrjä, Hanin & Pesonen, 1995; Syrjä, Hanin & Tarvonen, 1995), the findings provide support for the in-out of the zone principle in successful performance regarding during-game and just before game emotion patterns for the P+, P-, and N- emotions, but not the for

N+ adjectives. In addition, partial support was indicated for the dysfunctional emotions (the frequencies were more out than in, but without significant differences, except for N- before and P-N- adjectives after) regarding a day before and after successful performance, and for optimal emotions (the frequencies more out than in, but without significant differences, except for P+ and P+N+ words after) with regards to all four situations in poor performance. However, in poor performance dysfunctional emotions did not follow the in-out predictions. It is also noteworthy that regarding successful performance, negative optimal emotions did not follow the principle in any of the four situations. It could be that the negative optimal emotions are more situational than permanent in nature for players. Or, the impact of negative emotions can be helpful only if it is properly channelled. This finding may also indicate that the zones for these emotions are not accurately defined due to players' insufficient awareness.

The relationship between the performance ratios and optimal and dysfunctional emotions was also examined by calculating the correlation coefficient. No significant correlation was found, although for the P+ emotions a slight positive correlation was observed just before ( $p = 0.07$ ) and during ( $p = 0.06$ ) the performance. Additionally, the analysis of the joint effect of optimal and dysfunctional emotions also supported the in-out of the zone principle regarding the during-game situation, but not before or after the game. A low significant correlation was found between the performance ratios and joint emotion deviations ( $r_s = 0.16, p < 0.05$ ).

There seem to be several considerable issues with regards to these findings. First of all, it was observed that the in-out of the zone principle is not working properly 24 hours before and after both the successful and poor performance. The reason could simply be that players do not have to be emotionally effective a day before or after the game in the way that is required during the performance. Being emotionally effective in these situations might even be detrimental for players' preparation and recovery. On the other hand, an interesting curiosity taking into account this finding is that the players developing their emotion scales were asked to reflect their feelings prior to and during performance, not for example a day before or after. In future studies, it might be necessary to examine whether different emotions are relevant during preparation, task-execution, and recovery. If this is the case, athletes should create a separate emotions profile for each of these situations.

Secondly, the low predictive validity found for the principle in unsuccessful performance could be explained from several perspectives. Firstly, the findings, again, recommend that the zones should be developed for a whole range of intensities. According to these results, it could be that optimal emotions have impairing effects on performance when they are outside the zones, which results in poor performance. If this is the case, these findings argue against the in-out principle. Nonetheless, it seems that intensity of optimal emotions is the most critical indicator predicting performance. On the other hand, if the content of individual emotion scales is constructed as proposed in the individualised emotion profiling procedure, it might not be adequate to or relevant to all possible game-situations. Occasionally additional

emotions, outside the list defined for the individual emotion scale, might also influence the result of performance (this issue will be elaborated in chapter 7.1). Also, the effect of other forms of psychobiosocial states, such as players' motivation, cognition, bodily-somatic reactions, or for instance, co-operation, on performance might have an influence on these results. In future studies these variables should more clearly be considered.

Another possible interpretation for these results regarding unsuccessful performance is the difference between poor and average performance ratios. It is possible that players' self-rated performance ratios were poor or even below the average but far away from catastrophic. Hanin's in-out of the zone principle also contains an assumption relating to average performance (see chapter 3.1), and in fact, these findings were in line with this assumption. It is predicted that when player's current emotion intensities are outside both zones (optimal and dysfunctional), performance should be average.

In general, these findings reflect that at the top international level the difference between successful and poor performance is emotionally quite narrow and is mainly centred on the emotion patterns of the P+ adjectives. Thus, it could be concluded that optimal positive emotions are the most critical for predicting performance. In fact, it seems that the other emotions (N+, P-, and N-) are more or less situational and are critical for performance only occasionally. On the other hand, these findings might reflect that in the top level international context, players are so well focused and motivated that possible detrimental influences have been eliminated.

It is also worth pointing out that the predictive validity of the in-out of the zone principle as tested in the present study is dependent on the validity and reliability of the four discrete measurements of identification of emotion content, description of individually optimal and dysfunctional zones, assessments of current task-related situational emotion intensities, and evaluation of performance. Therefore, the findings of the present study need to be introspected in the light of this tentative notification.

One way to understand this complicated relationship between emotions and performance is to consider the functional interpretations of why the optimal emotions are useful for players and the dysfunctional emotions harmful. The findings indicate that by using the concepts of the construct of energy utilization and mobilisation the impact of emotion on performance can be explained. The effect of emotions upon performance seems to follow the principle that optimal emotions impact on energy utilization (U+) and mobilization (M+), whereas dysfunctional emotions impact on energy demobilization (M-) and misuse (U-). However, it was also noticed that in some cases emotions influence performance through motivational factors or cognitive functions (such as concentration). This observation needs further study.

## 7 GENERAL DISCUSSION

The present study centred on exploring performance-related emotional experiences in highly skilled players from two soccer teams within content, intensity, and time dimensions. The findings of the study provide support for the IZOF assumptions regarding emotion content and intensity. As expected, the emotion-performance relationship is individually unique, reflecting each player's idiosyncratic characteristics (Bortoli et al, 1997; Hanin, 1978, 1986, 1993, 1994, 1997a; Hanin & Syrjä, 1995a, b; Johnson et al, 1995; Rodazza et al, 1998). The adjectives describing performance-related emotions were dissimilar between the players. Also as predicted, the level of optimal or dysfunctional intensity zones was low for one player, moderate for other, and high for a third. The predictive validity of the in-out of the zone principle describing the emotion-performance relationship was found to be relatively high regarding just before and during-game activities in successful performance. In addition, the functional meaning of emotions seems to follow the construct of energy utilization and energy mobilization proposed in the model.

The investigation further extends the earlier IZOF-based studies regarding the temporal patterns of emotions. It was found that individually optimal and dysfunctional emotions change within the season, from game to game, and within games. Hence, the assumptions of the IZOF model could be expanded using the findings of the present study. For example, it could be hypothesised that a) players change their emotion profiles after gaining their experiences of their own performance-related emotions, b) regardless of repeated assessments, inter-individual and group level emotion patterns remain rather similar, c) players' emotions vary from pre-game through mid-game to post-game, although only few emotions change at the same time, or d) emotions vary differently between players from early preparation to post-game recovery. It should, however, be emphasised that all of these findings need to be more clearly corroborated in future studies.



Conceptually the present study expands the research from anxiety or other single emotion constellations to consider a wider spectrum of positive and negative emotional experiences. The study shows that to perform successfully or poorly athletes need to experience a number of both positive and negative emotions. The emotions accompanied by successful performance were observed to be different from those accompanied by unsuccessful performance. This finding was observed at both the intraindividual and group level. In addition, classifying emotions into the four emotion categories of pleasant optimal (P+), unpleasant optimal (N+), pleasant dysfunctional (P-), and unpleasant dysfunctional (N-) was strongly supported in the present investigation and thus conceptually extends the earlier studies on emotions in the sport setting. It is also noteworthy that the dimensions of the PENTA construct were found to be a systematic and practical guiding principle in studying emotions in the sport setting. Following the sub-components of each dimension, emotional experiences were described, step by step, resulting in a holistic description.

Methodologically, the findings support the use of individualised emotion profiling procedure as a challenge and alternative to standardised normative scales. The individualised procedure enables the analysis of both the individual characteristics related to optimal and dysfunctional emotions (idiographic), and the inter-individual, within-group, and inter-group emotion patterns (nomothetic). Thus, both idiographic and nomothetic approaches were considered in the analyses, as several researchers have recommended (Dunn, 1994; Hackfort & Schwenkmezger, 1989; Weinberg, 1990). Nevertheless, in some cases (see e.g. chapter 6.3) the inter-individual and group level comparisons seem to suffer from the emotion scales having individually different content (different adjectives). Therefore, in these particular cases the use of an aggregate emotion list (as a similar-for-all scale), consisting of core emotion descriptions of each of the four emotion categories for the specific sport, might be more appropriate. The findings of the present study provide a tentative list of the most crucial emotions which have an influence on soccer performance (see Table 7).

It should be also emphasised that the development of individual emotion profile and task-related emotion measurements (predicted, current, and recalled) provided a practical method to study players' performance-related emotional experiences. The procedure enables players to analyse their past experiences playing soccer, which is considered to be a useful training procedure for enhancing performance in top level sports. The method also helps athletes to expand their awareness of their own individually relevant optimal and dysfunctional emotional experiences. At the same time the procedure provides athletes with a tool to predict, monitor, and control emotions before, during and after games and practices, and researchers a tool to systematically investigate emotions in a real-life top level sport setting without harmful and distracting effects on the participants.

On the other hand, the findings of the study showed very clearly that athletes needed to develop several emotion profiles before they are able to create a profile that satisfies them. This finding indicates that to construct an accurate emotion profile players need to some extent "active use" of the helpful

and harmful emotional experiences relating to their performance by, for example, carrying out task-related emotion measurements. Therefore, the results of the study have implications that go beyond the notion that athletes should be able to identify their intensity zones by using their past experience alone (Hanin & Syrjä, 1996; Harger & Raglin, 1994).

In conclusion, the present investigation showed that the IZOF model is theoretically, conceptually, and methodologically a promising framework for describing, predicting, and explaining the multidimensional relationship between players' emotional experiences and performance. Nevertheless, the assumptions of the model are still limited to the relatively narrow field of the total construct of psychobiosocial states. The interactive role of the emotions and other modalities (motivational, cognition, bodily-somatic, etc.) of a person's mind and body that influence athletic performance need to be more clearly indicated before the model can fully describe and explain the emotion-performance relationship. Theoretically, the model is in need of more fundamental perspectives regarding the sources of emotions and emotion categories. In the sections that follow, several methodological considerations and limitations will be raised after which the practical implications of the findings and direction for future research will be discussed.

## 7.1 Methodological considerations

*Emotion measures.* The power of the athlete-oriented emotion scale lies in its individually relevant content. Thus, the face validity of emotion measurements using the individualised procedure is assumed to be good. The present study supports this assumption. Nonetheless, the face validity of emotion content also depends on the emotion descriptions included in the stimulus list of adjectives. Does the list contain individually relevant words and are there enough adjectives, are the crucial questions. For instance, Lazarus (1991, p. 82) has classified emotions into four groups: positive emotions, negative emotions, "borderline emotions" (can not be classified as positive or negative, such as hope and compassion), and "nonemotions" (treated as emotions, but are not). The stimulus list of positive and negative adjectives used in the present study ignores the borderline emotions. Furthermore, two recent studies (Bortoli et al, 1997; Robazza et al, 1998) using just one list of adjectives (positive and negative emotion descriptions randomly arranged) showed that athletes can classify generally pleasant emotions into the unpleasant category and vice versa.

One approach to avoiding these concerns could be the use of the athlete's own words. For example, Fehr and Russel (1984) showed that people could give examples for emotions very easily. They requested 200 undergraduates to write as many terms as members of the concept of emotion as they could within a minute. Although syntactic forms (e.g. happy and happiness) were combined, the list included 383 different examples of emotions. Perhaps, in creating a sport-specific list of emotions, a similar procedure should be followed. Thus, for

future studies there could be a sport-specific stimulus list with the adjectives in the athletes' own "language".

A limitation of the present study is that the individual meaning of emotions was not taken into account. Therefore, it remains unclear why there was so much inter-individual variability in emotion content. In fact, it is possible that different players using e.g. near synonyms or closely related adjectives are indicating the same emotional experience. In future studies, to see what is beyond the words selected for the individual emotion profiles, the researchers should emphasise such questions as: What are the players indicating with each optimal or dysfunctional emotion description? What do players mean with these words? From this perspective, it seems proper to seek optional procedures such as interviews or other qualitative methods as an extension to individualised emotion profiling. By knowing the individual meaning of emotions the assumption of the IZOF model regarding the content of emotions could be examined at an extended level. On the other hand, by using the new knowledge about the near synonyms and closely related emotions, researchers may be able to describe sport-specific emotion categories, "families" or list of basic emotions which consists of the most critical emotions that influences athletic performance (see e.g. Ekman, 1992; Lazarus, 1991; Shaver et al, 1987).

Another limitation of the current procedure used to identify emotions is that the importance or weight of the emotions upon athletic performance was not taken into account. It is unlikely that all the emotions have a similar effect on performance. Some emotions might have a more relevant and critical role for performance than others. In fact, in the present study this notion was partly supported by the findings from the analyses of the task-related situational emotion patterns and the in-out of the zone principle. For example, it was noticed that the emotions described in the profiles never all changed simultaneously. It was also clearly indicated that positive optimal emotion descriptions contained the most crucial emotional experiences related to performance.

It is also worth pointing out that if an individualised emotion profile is developed on basis of athletes' past performance history, it might not have relevance for all situations in the real-life setting. In other words, as in the present study, the emotion profiles included only those emotions that were seen as relevant in the situations experienced prior to and during typical successful and unsuccessful performance. However, it can not be certain that all the emotions that could possibly influence athlete's performance are listed in his or her individual profile. In the real-life setting there is always the possibility of unexpected emotions, which are relevant for a particular situation, and which were not considered at the time the individualised emotion scale was constructed. For instance, circumstances might evoke unusual emotions that are not experienced in typical successful or unsuccessful performance. Therefore, the content validity of the situational task-related measurements using athlete-generated scales is questionable. In future studies as the need arises it might be necessary to give athletes the possibility to add such situational emotions into

the emotion scale. Doing this will also help in listing the emotions involved in athletic performance.

Several considerations could be also outlined concerning the procedure for identifying the optimal and dysfunctional intensity zones. With regards to the procedure used in the present study, it is not clear what happens when the intensity falls below or rises above the optimal or dysfunctional zones. It is also not clear at which intensity level an emotion is effective, neutral, and detrimental for performance. The findings of the present study showing, for instance, that several emotions were selected by the same player for functionally different emotion categories, either for the same or for the repeated emotion profile, indicates that at least these emotions can depending on the level of intensity have both enhancing and impairing effects on performance. Therefore, it remains unclear which emotions have only harmful, useful, or both effects on performance and whether these effects are inter-individually different. One possible way out of this limitation is to identify the impact of an emotion on performance for a whole range of intensities from nothing at all to the maximum possible (see Hanin, 1999).

*Performance measures.* Courneya and Chelladurai (1991) have argued that, especially in team sport, both conceptually and technically the development of performance measures continues to be a challenge for researchers. In fact, a scale which integrates objective measures of the individual's performance process in contact team sports and subjective self-ratings is needed. An objective measure of an athlete's performance process may indicate, for instance, how well a player manages to use his strong and weak points / abilities as a player during the task execution. The self-rating method, however, has advantages (e.g. subjective feelings about a performance) which can not be captured by any objective measures, and therefore, both procedures are needed.

Nevertheless, subjective performance measures could usefully be extended in future studies to include such self-ratings as the use of one's own skill potential, energy, effort, and so on. These indicators might be more "objectively" self-rated by athletes than simple success-failure assessment. Furthermore, Gould and Tuffey (1996) have proposed a video-recall technique which allows for the study of successful and unsuccessful performances, identified before the emotion measurements, more systematically and without the difficulties associated with subjective or objective measurements.

### **The generalizability of the findings**

The external validity of the findings is considered to be relatively good in terms of the following: male, top-level sport, soccer or other team sport. For this particular setting the sample was very representative containing the most skilful and talented soccer players of two "generations" of players in Finland. The head coach selected the players for the team, and all the players who participated in the games and training camps also took part in the psychological preparation program. However, the rather small sample size in some of the analyses and relatively low number of emotion measures could

have had some unexpected consequences that might impair the external validity of the findings.

## 7.2 Future directions

Summarising the earlier research on emotions and the notions underlined in the present investigation, a major goal for researchers in future studies is to identify the most crucial emotions related to athletic performance. To define these emotions more studies are needed which continue the investigation on the wider range of positive and negative emotions. Special emphasis should be centred on the following issues within each of the five basic dimensions proposed in the IZOF model. Some of these issues are proposals for further developing the individualised emotion profiling procedure.

### *The content dimension.*

1. The personal meaning of the individually selected adjectives should be described using alternative methods such as open-ended questions, interviews or other qualitative procedures.
2. The weight or importance of the selected emotions on performance and / or on individual athletes should be taken into consideration (see Hanin, 1999).
3. For task-related real-life measurements, athletes should be able to add possible new situational emotions such as might occur immediately after scoring a goal or after a referee's mistake (outside the athlete-generated list) into the emotion scales.
4. The functional meaning of the impact of emotion on performance should be more clearly indicated by extending the analysis to the interactive role of different emotions and emotion categories and to the role of motivation and cognition as a mediating process.

These analyses would help researchers to describe what lies beyond the words selected for emotion profiles, and thus extend the studies validating the IZOF assumption regarding the content of emotions. Furthermore, such work could help to identify the most relevant and critical emotions (basic emotions) or emotion categories related to top-level athletic performance. These issues also could indicate how emotions are connected to each other and what kind of influence (functional significance) they have on performance.

### *The intensity dimension.*

5. The impact of emotion intensity on performance should be studied across a whole range of intensities, not just in typical successful and unsuccessful performances (see Hanin, 1999).

This would enable us to evaluate the role of emotion intensity in describing the emotion-performance relationship. The shape of the relationship could be described by each emotion separately and jointly. In addition, these analyses

would show what is beyond the zones and what emotions have both an enhancing and impairing influence upon performance.

*The time dimension.*

6. Emotion profiles should be identified separately for preparation, during-game activity, and recovery.
7. The during-game pattern of emotions should be indicated by utilising, for instance, the video-recall technique (see Gould & Tuffey, 1996).

These analyses would offer explanations as to what constitute the most critical emotions for preparation, task execution, and recovery. This investigation would also allow us to explore the reasons, for better understanding of the emotion-performance relationship, why emotions change along with the task execution.

*The context dimension.*

8. More studies analysing the emotions related to different tasks, such as competition vs. training, different game positions (defence vs. offence vs. goal-keeper), easy game vs. difficult game, are needed.

The role of the task demands could be then identified, and thus this analysis would offer one possible explanation to why emotion content and intensity are so different between athletes.

*The form dimension.*

9. The role of motivation, cognition and bodily-somatic reactions influencing performance should be taken into account.
10. In team sports the effects of interaction and communication between athletes explaining emotional experiences should also be studied.

Thus, the emotion-performance relationships could be described both without and together with the effect of other modalities of psychobiosocial states. In addition, the influence of one athlete's emotional states on another could be described.

It is also notable that in future studies on emotions the first step for researchers is to "teach" athletes' to be aware of their performance-related emotions. For this purpose the individualised emotion profiling procedure is recommended as one possible, practical, and useful tool. After athletes' awareness of their emotional experiences has increased, emotions could be studied using qualitative and quantitative methods at the extended level.

### **7.3 Practical implications**

From the practical point of view, the assumptions of the IZOF model and the findings of the present study provide several practical proposals for coaches and athletes in the team environment. According to the principles of the IZOF model, the major goal for athletes and coaches is to create effective individual patterns of play, preparation, recovers, etc. Increasing the awareness of

individually effective and ineffective patterns of feelings, motivational indicators, concentration abilities, experience of the body, use of motor potential, co-acting, and so on should be central procedures for coaches and athletes. To make all of this possible special individual-oriented procedures, such the utilised in the present study, will be needed. Also, the coaching environment in the team should be organised in a way which supports individual characteristics.

The findings of unique emotion lists, intensities, and temporal dynamics makes coaches' ability to work in the team sport environment difficult. If the effect of emotions on performance is different between individuals, the question of how the coach can influence all the players at the same time without causing detrimental effects will be central. The role of coach-athlete interaction should be emphasised in communication in teams. Also, the responsibility and commitment of each team member on the best utilization of his or her own potential should be considered in coaching strategies. Thus, an authoritarian management procedure holding to the idea of just one leader could be labeled as "old fashioned".

The high variation in the repeated assessments indicating players' awareness of their emotions is a challenge for coaches. It would seem that emotions in team sports are still an insufficiently used resource. Anecdotes indicate that only few players, usually experienced, have managed to generate special self-oriented routines to monitor and control emotions before and during activities. It seems that there is lack of practical and useful tools for emotion regulation that suit the team sport environment.

Another crucial issue for coaches in team sports is how well they know their players' individual characteristics. For instance, the coaches who have a lengthy sporting experience of their own might by accident consider their own special routines and emotional states as "the only right ones". In other words, demanding that athletes have similar experiences to those the coach found to be effective might not bring about the result which is wanted. For the coach, it is important to realise that athletes are emotionally individuals and require unique routines and emotional states to achieve their best performance. On the other hand, athletes should also be brought to realise that their teammates are individuals and need individual routines. The anecdotal data, obtained along with the psychological preparation program, has shown, for instance, that preparation (mental and physical "warm-up") routines are very different for different players. Therefore, each athlete should recognise his or her specialities regarding the most effective preparation routines, game management, recovery and so on. Also, awareness of the effect of sleeping, eating, friends, special exercise, warm-up, and other activities on one's emotions should be noted. For each individual a central question should be how emotion can be evoked, maintained, and changed before, during, and after activities in order to achieve the situational goal (to prepare, to execute, to recover).

The situational emotion patterns indicated that all the four emotion categories seem to have a different role in performance. Several tentative implications could be provided for the emotions in each category. Positive optimal emotions are the most critical in performance with high-level

intensities and strong variations. Negative optimal emotions have a special role in preparation and recovery, but are also critical in performance with moderate intensities and variations. Dysfunctional positive emotions also seem to have a role in athletes' preparation and recovery routines, but are harmful during the performance. Finally, dysfunctional negative emotions only indicate situational emotions, which are always a distraction away from performance. These negative emotions are usually observed to be on a very low level and vary only little.

Finally, the in-out of the zone principle provides the player with a practical tool to predict, monitor, and control emotions during preparation, game activity, and recovery. Using the personal emotion list and intensity zones players are able to concentrate on individually relevant emotions. Optimal emotions constitute a goal to achieve, whereas dysfunctional emotions work as indicators for players, enabling them to avoid detrimental, harmful and distracting states in performance. Awareness of emotions can thus help athletes to enhance their performance. On the other hand the findings of the present study also suggest that some emotions can have both helpful and harmful impacts on performance for an individual. If this finding is confirmed, it would suggest that players should pay more attention to how much they feel rather than what particular emotion they feel. Athletes should thus concentrate on the intensity of emotion, not on evoking specific "necessary" feelings. However, as already stated this idea is in need of further clarification and should be considered along with the notion of how relevant and important a given emotion is for performance.



## 8 YHTEENVETO

*Johdanto.* Pelatessaan hyvin jalkapalloilija kokee tiettyjä suorituksen kannalta hyödyllisiä tunteita. Myös epäonnistuneeseen pelisuoritukseen liittyy monenlaisia tunnetiloja. Tämän tutkimuksen tarkoituksena oli selvittää, minkälaisia nämä tunnetilat ovat, muuttuvatko ne suorituksen kuluessa ja voidaanko niiden avulla ennustaa suoritusta.

Tutkimuksessa tarkasteltiin tunteen käsitettä Lazaruksen (1991, 1993) tunneteorian pohjalta. Teoriassa emootiot, kognitiot ja motiivit kuvataan erillisinä mielenrakenteina, jotka kuitenkin ovat sidoksissa toisiinsa. Lazarus kuvaa tunteita prosessiksi, joka liittyy jatkuvasti muuttuvaan vuorovaikutukseen henkilön ja ympäristön välillä. Emootio on teorian mukaan henkilön tietoinen tai tiedostamaton arvio (appraisal) yksilön ja ympäristön välisen vuorovaikutuksen luonteesta, johon vaikuttavat tilanteen vaatimukset ja henkilön ominaispiirteet.

Urheilusuoritukseen liittyvien tunteiden aikaisempi tutkimus on keskittynyt lähes poikkeuksetta vain yhteen negatiiviseen tunteeseen, ahdistukseen (anxiety). Ahdistuksen käsite on viime vuosina eriytynyt tutkimuksellisesti kahdella - somaattiseen ja kognitiiviseen komponenttiin. Monet tutkijat ovat kuitenkin ilmaisseet tyytymättömyytensä tutkimuksen kapea-alaisuuteen ja toivoneet, että muitakin suoritukseen liittyviä tuntemuksia selvitettäisiin (ks. esim. Hanin, 1997a; Kerr, 1997). Viimeaikaiset tutkimukset, joissa on selvitetty mm. optimaalista kokemusta (flow), itseluottamusta sekä yleisemmin positiivisia ja negatiivisia mielialoja kuvaavia tunteita, ovat osoittaneet, että urheilusuoritukseen liittyy ahdistuksen lisäksi myös muita negatiivisia ja positiivisia tunteita.

Tunteiden yhteyttä urheilusuoritukseen on selvitetty testaamalla yleensä muilla tieteenaloilla ja muualla kuin urheilukontekstissa kehitettyjä teorioita ja malleja. Eniten testattuja teoreettisia malleja ovat olleet drive-teoria, käännetyn U:n hypoteesi, multidimensionaalinen ahdistusteoria ja ZOF-malli (Zones of Optimal Functioning). Mikään aikaisemmista teoreettisista malleista ei kuitenkaan ole saavuttanut tutkijoiden yksimielistä hyväksyntää, sillä tutkimustulok-

set ovat olleet ristiriitaisia. Tutkijat ovat esittäneet lukuisia käsitteellisiä ja metodologisia ongelmia. Kyseiset mallit ja teorit eivät esimerkiksi huomioi ihmisten yksilöllisiä eroja (Hanin, 1997a). Hanin on kritisoinut sitä, että suurimmassa osassa tutkimuksista on käytetty nomoteettista eli yleisiin lainalaisuuksiin pyrkivää lähestymistapaa ja standardoituja, kaikille samansisältöisiä mittareita. Tämä on myös johtanut siihen, että lähes poikkeuksetta tutkimuksissa on selvitetty tunteen yhteyttä suoritukseen tarkastelemalla ainoastaan tunteen intensiteettiä eli määrää. Tunteen vaikutusta suoritukseen on pidetty joko haitallisena, kun kyseessä on ollut negatiivinen, epämiellyttävä tunne, tai hyödyllisenä, kun kyseessä on ollut positiivinen, miellyttävä tunne. On esimerkiksi pidetty itsensä selvyytenä, että ahdistus vaikuttaa haitallisesti urheilusuoritukseen. Muutamassa viimeaikaisessa tutkimuksessa tämä oletus on osoitettu osittain vääräksi (ks. esim. Jones, 1995a). Myös ajallisesti tai kontekstuaalisesti aikaisempi tutkimus on rajoittunut lähes pelkästään suoritusta ennakoivaan kilpailutilanteeseen.

Haninin (1993, 1997a) IZOF-mallia (Individual Zones of Optimal Functioning Model) pidetään vaihtoehtoisena teoreettisena viitekehyksenä ryhmäsuuntautuneille malleille ja teorioille. IZOF-malli on Haninin aikaisemman ZOF-mallin laajennettu versio. Malli sisältää neljä perusolettamusta, jotka ovat emotionaalisten kokemusten multidimensionaalisuus, tunteiden sisällön periaate, "sisällä-ulkona" -periaate, ja tunteen vaikutuksen funktionaalinen tulkinna. Ensinnäkin IZOF-malli ehdottaa viittä perusulottuvuutta, joilla suoritustunteita tulisi tutkia. Nämä ulottuvuudet ovat muoto, sisältö, määrä, aika ja konteksti. Toinen olettamus jakaa tunteet sisällöllisesti neljään kategoriaan, joissa yhdistyy kaksi tunteiden peruspiirrettä - positiivisuus ja negatiivisuus sekä hyödyllisyys ja haitallisuus. Mallin ehdottamat neljä tunnekategoriaa ovat: a) positiiviset, miellyttävät hyödylliset tunteet (P+); b) negatiiviset, epämiellyttävät hyödylliset tunteet (N+); c) positiiviset, miellyttävät haitalliset tunteet (P-); ja d) negatiiviset, epämiellyttävät haitalliset tunteet (N-). Kolmas perusolettamus, sisällä-ulkona -periaate, olettaa, että a) onnistunut suoritus on odotettavissa, kun urheilijan tilannekohtainen tunneintensiteetti on hänen optimaalisen intensiteettialueensa lähellä (sisällä) ja kaukana (ulkona) hänen dysfunktionaalisesta alueestaan ja b) epäonnistunut suoritus on odotettavissa, kun urheilijan tilannekohtainen tunneintensiteetti on kaukana hänen optimaalisesta alueestaan ja lähellä hänen dysfunktionaalista intensiteettialuettaan. Viimeinen IZOF-mallin perusolettamus ehdottaa, että tunteen funktionaalinen vaikutus perustuu urheilijan energiantuotto- (yritys, intensiteetti) ja energiankäyttömekanismiin (tehokkuus, taito). IZOF-mallin oletuksia on tutkittu muutamissa aikaisemmissa tutkimuksissa ja tulokset ovat olleet lupaavia (ks. esim. Hanin, 1997a; Hanin & Syrjä, 1995a). Tämä tutkimus perustuu teoreettisesti, käsitteellisesti ja metodologisesti IZOF-mallin oletuksiin.

Tutkimuksen tarkoituksena oli selvittää onnistuneeseen ja epäonnistuneeseen jalkapallosuoritukseen liittyviä positiivisia ja negatiivisia tuntemuksia käyttämällä idiograafista eli yksilöllisiä piirteitä kuvaavaa lähestymistapaa. Tutkimuksen perustavoitteena oli toistaa aikaisemmat IZOF-mallia testaavat tutkimukset, jotka ovat keskittyneet tunteen sisällön ja määrän dimensioihin, sekä laajentaa tutkimusta ajalliseen dimensioon.

Tutkimus jaettiin neljään pääongelmaan. Ensimmäinen ongelma-alue keskittyi tunteiden laatuun eli sisältöön. Siinä tutkittiin, millä adjektiiveilla pelaajat kuvaavat tyypillisiä onnistuneeseen ja epäonnistuneeseen suoritukseen liittyviä tuntemuksia, miten valitut adjektiivit vaihtelivat pelaajien välillä, ja miten pelaajat muuttivat adjektiiveja uusintamittauksissa. Toisena tutkimustehtävänä oli tarkastella tuntemusten määrää eli intensiteettiä. Tässä osiossa tutkittiin, miten voimakkaaksi pelaajat kuvaavat valitsemiensa tunteiden intensiteetin tyypillisessä onnistuneessa ja epäonnistuneessa suorituksessa, miten intensiteettitasot eroavat eri pelaajilla, ja miten pelaajat muuttavat optimaalisia ja dysfunktionaalisia intensiteettitasojaan uusintamittauksissa. Kolmanneksi selvitetiin, miten tunteiden intensiteetit vaihtelivat tilanteesta 24 tuntia ennen pelisuoritusta tilanteeseen 30 minuuttia ottelun jälkeen. Viimeiseksi selvitetiin, miten tunteet ja pelisuoritus vaikuttavat toisiinsa. Tätä tutkittiin testaamalla, miten IZOF-mallissa ehdotetut "sisällä-ulkona" -hypoteesit toimivat, sekä selvittämällä, minkälainen on tunteiden funktionaalinen vaikutustapa pelaajiin eli miten tunteet ovat heille hyödyllisiä tai haitallisia.

*Tutkimuksen kohderyhmä ja menetelmät.* Tutkimuksen kohderyhmänä oli 68 jalkapalloilijaa (ikä 17 - 23 vuotta; ka = 20,4, s = 1.1), jotka osallistuivat vuosien 1994 - 1995 ja 1996 - 1997 Suomen alle 21-vuotiaiden poikien maajoukkueisiin. Yllä mainittujen kahden vuoden aikana ensimmäinen joukkue kokoontui 11 kertaa ja toinen joukkue 9 kertaa. Joukkueen päävalmentaja valitsi pelaajat kuhunkin tapahtumaan. Vaikka eri kokoontumiskerralla joukkueiden kokoonpano vaihteli hieman, kaikki pelaajat osallistuivat tutkimukseen. Tutkimuksen osallistujat edustavat siten ryhmää, johon kuuluvat kahdesta poikien ikäluokasta kaikkein lahjakkaimmat ja taitavimmat pelaajat.

Tutkimusaineisto kerättiin tunneprofilointimenetelmällä, joka otti huomioon yksilöllisiä ominaispiirteitä. Menetelmään kuuluu positiivisten ja negatiivisten tunteiden virikelistä, jota pelaajat käyttivät valitessaan omia tuntemuksiaan kuvaavia adjektiiveja, sekä hieman modifioitu Borgin (1982) CR-10 asteikko, jolla pelaajat määrittivät tunteen intensiteettitasoja. Jokaista pelaajaa pyydettiin tekemään henkilökohtainen tunneprofiili, johon hän valitsi 4 - 5 positiivista ja 4 - 5 negatiivista adjektiivia kuvaamaan tuntemuksia, jotka liittyivät sekä tyypilliseen onnistuneeseen että tyypilliseen epäonnistuneeseen pelisuoritukseen. Lisäksi pelaajia pyydettiin määrittämään jokaiselle valitsemälleen tunteelle sen optimaalinen tai dysfunktionaalinen intensiteettitaso (zones). Optimaalinen intensiteettitaso kuvaa tunteen voimakkuutta onnistuneessa ja dysfunktionaalinen taso epäonnistuneessa suorituksessa. 24 pelaajaa teki tunneprofiilin kaksi kertaa ja 11 pelaajaa kolme kertaa. Lisäksi 17 pelaajaa osallistui neljän kansainvälisen jalkapallo-ottelun ohessa mittauksiin, joissa he arvioivat valitsemiensa tunteiden intensiteettiä seitsemässä eri tilanteeseen. Mittaukset suoritettiin 24 tuntia ennen ottelua ja 30 minuuttia ottelun jälkeen. 24 tuntia ennen ottelua pelaajat arvioivat a) miltä heistä tuntuu juuri nyt ja b) mitä he kuvittelevat tuntevansa juuri ennen ottelun alkua. 30 minuuttia ottelun jälkeen pelaajat arvioivat a) miltä heistä tuntuu juuri nyt, b) miltä heistä tuntui 1. puoliajan alussa, c) miltä heistä tuntui 1. puoliajan lopussa, d) miltä heistä tuntui 2. puoliajan alussa ja e) miltä heistä tuntui 2. puoliajan lopussa. Samalla pelaajat ar-

vioivat pelisuorituksensa onnistumista subjektiivisesti modifioidulla Borgin CR-10 asteikolla. Suoritus arvioitiin siten, että se ensin kuvasi koko ottelua ja sitten kaikkia neljää eri ottelun vaihetta erikseen (ks. yllä). Lisäksi 17 pelaajaa pyydettiin kirjoittamaan omin sanoin, miksi ja miten kukin hänen valitsemansa tunne on hänelle hyödyllinen tai haitallinen.

*Tulokset.* Tulokset osoittivat, että kuvatessaan tyypillistä onnistunutta suoritusta pelaajat käyttivät eri adjektiiveja kuin kuvatessaan tyypillistä epäonnistunutta suoritusta. Tulos havaittiin sekä yksilö- että ryhmätasolla. Ryhmätasolla eniten valittuja positiivisia hyödyllisiä tunteita kuvaavia adjektiiveja olivat energinen, jonka valitsi 47 % pelaajista, sitten latautunut (44), luottavainen (40), motivoitunut (34) ja halukas (29). Suosituimmat adjektiivit kuvaamaan positiivisia haitallisia tunteita olivat sen sijaan huoleton (40 %), tyytyväinen (29), tyyni (21), mukava (21) ja vilkas (16). Negatiivisia hyödyllisiä tunteita pelaajat kuvasivat eniten sanoilla jännittynyt (63 %), tyytymätön (52), hyökkäävä (39) ja kiihkeä (32). Väsynyt (45 %), haluton (37), epävarma (34), veltto (27) ja laiska (26) olivat tyypillisimmät negatiivisia haitallisia tunteita kuvaavista adjektiiveista. Henkilöiden välisessä vertailussa huomattiin, että yhdenkään pelaajan tunneluettelo ei ollut täysin identtinen toisten pelaajien luetteloiden kanssa. Tunneluettelot analysointiin laskemalla yhtäläisyyskerroin (content overlap score), joka vaihtelee arvojen 0 (täysin erilainen) ja 1 (täysin samanlainen) välillä. Keskimääräinen yhtäläisyyskerroin oli 0.23, mikä osoittaa, että tyypillisessä tapauksessa vain noin 23 % valituista adjektiiveista oli samanlaisia pelaajien välillä.

Uusintamittaukset osoittivat, että pelaajat vaihtoivat tunteita kuvaavia adjektiivejaan. Kun pelaajia pyydettiin uudelleen rakentamaan henkilökohtainen tunneprofiili, noin puolet (yhtäläisyyskerroin = 0.49 - 0.50) adjektiiveista oli erilaisia sekä ensimmäisen ja toisen että toisen ja kolmannen tunneprofiilin välillä. Yksi mahdollinen selitys adjektiivien muuttamiselle saattaa olla se, että pelaajat tarkemmin tiedostivat omat suoritukseen liittyvät tunteensa. Henkilöiden välinen variaatio ja adjektiivien käyttö säilyivät ryhmätasolla kuitenkin melko stabiileina riippumatta uusintamittauksista. Tulokset osoittivat, että tunneprofiilit ovat pelaajien välillä sisällöllisesti hyvin erilaisia. Erilaisuus saattaa johtua henkilöiden ja tehtävien erilaisista vaatimuksista. Tutkimus siis tuki IZOF-mallin oletuksia, jotka koskevat tunteiden sisältöä.

Pelaajien optimaaliset ja dysfunktionaaliset intensiteettitasot vaihtelivat eri tunteiden ja eri tunnekategorioiden välillä. Ryhmätasolla tyypillinen (mediaani) intensiteetti oli positiivisille hyödyllisille tunteille 7.5, negatiivisille hyödyllisille tunteille 4, positiivisille haitallisille tunteille 5, ja negatiivisille haitallisille tunteille 6. Henkilöiden välisessä vertailussa huomattiin, että saman adjektiivin optimaaliset tai dysfunktionaaliset intensiteettitasot saattoivat toisilla pelaajilla olla hyvin alhaisia ja toisilla taas hyvin korkeita. Tulos osoittaa, että tunneprofiilit vaihtelevat sisällön lisäksi myös intensiteetiltään. Uusintamittauksissa pelaajat vaihtoivat tunteidensa intensiteettitasoja melko paljon. Tulokset näyttivät, että pelaajat muuttivat noin puolet intensiteettitasoistaan, kun heitä pyydettiin uudelleen määrittelemään samalle tunteelle optimaaliset ja dysfunktionaaliset tasot CR-10 asteikolla. Henkilöiden välinen vaihtelu ja ryhmän keskimääräiset intensiteettitasot säilyivät kuitenkin melko samansuuruisi-

na riippumatta uusituista tunneprofiileista. Tutkimus tuki IZOF-mallin oletuksia, jotka koskevat tunteiden intensiteettiä. Lisäksi tutkimus laajensi tunteiden sisällön ja määrän tarkastelua ajalliseen perspektiiviin selvittämällä miten tunneprofiilit muuttuivat ajan kuluessa.

Neljän maaottelun ohessa suoritettut tunnemittaukset näyttivät, että pelaajien tunteet vaihtelevat suuresti tilanteesta 24 tuntia ennen ottelua tilanteeseen 30 minuuttia sen jälkeen. Sama tulos todettiin sekä yksilö- että ryhmätasolla. Positiiviset hyödylliset tunteet vaihtelivat pelaajilla eniten. Kaikista tapauksista 68 prosentilla positiiviset hyödylliset tunteet vaihtelivat tilastollisesti merkittävästi ( $p < 0.05$ ). Pelaajat arvioivat niille myös keskimäärin korkeammat intensiteettitasot kuin muiden tunnekategorioiden tunteille lukuunottamatta tilanteita 24 tuntia ennen ottelua ja 30 minuuttia sen jälkeen. Negatiivisten haitallisten tunteiden intensiteettitasot olivat tavallisesti alhaisimmat, ja niiden vaihtelukin oli vähäisintä (26 %). Nämä tunteet näyttäisivät ilmaantuvan vain ajoittain. Positiivisten haitallisten (38 %) ja negatiivisten hyödyllisten (47 %) tunteiden vaihtelu oli keskimääräistä, ja niiden intensiteettitaso pelaajat määrittivät tavallisesti CR-10 asteikon keskivaiheille. Yksilöiden välillä havaittiin kuitenkin eroja tunteiden vaihtelun määrässä. Tunteiden muutoksiin tai muutumattomuuteen suorituksen kuluessa saattavat vaikuttaa esimerkiksi muutokset kehon energiatasossa (somaattiset reaktiot), motivaatiotilassa tai kyvyssä keskittyä. Tunteisiin saattavat vaikuttaa myös pelitilanne (voitolla - tappiolla), henkilökohtainen, pelikaverin tai vastustajan onnistuminen ottelussa, vastustajan taitotaso, tuomarin toiminta tai esimerkiksi sääolosuhteet. Aikaisemmissa tutkimuksissa ei juurikaan ole selvitetty suorituksen aikaisia ja suorituksen jälkeisiä tunnetiloja, vaan niissä on tarkasteltu ainoastaan suoritusta ennakoivien tuntemusten vaihtelua. Täten tulokset laajentavat suoritukseen liittyvien tuntemusten tutkimusta.

Tunteiden ja pelisuorituksen välistä yhteyttä tutkittiin testaamalla IZOF-mallin sisällä-ulkona -hypoteeseja. Tulokset tukivat onnistuneeseen suoritukseen liittyvää hypoteesia, kun suoritusta verrattiin juuri ennen ottelua vallitsevaan tunnetilaan ja suorituksen aikaiseen tunnetilaan. Hypoteesi ei saanut tukea tilanteissa 24 tuntia ennen ottelua ja 30 minuuttia sen jälkeen. Tulokset eivät myöskään tukeneet epäonnistuneeseen suoritukseen liittyvää hypoteesia. Kuten IZOF-mallissa oletettiin, tunteiden vaikutusmekanismi liittyy pelaajien tapaan käyttää ja tuottaa energiaa. Sisällönanalyysi osoitti, että tunteiden hyödyllisyyttä kuvaavista pelaajien vastauksista osa viittasi energian tehokkaaseen hyväksikäyttöön. Pelaajat kertoivat pystyvänsä esimerkiksi keskittymään paremmin ottelussa. Osa vastuksista sen sijaan viittasi energian tuottoon tai tunteiden aktivoivaan vaikutukseen. Vastaavasti tunteiden haitallisuutta ilmaisevista pelaajien kuvauksista sisällönanalyysi osoitti, että osa viittasi energian epäkäytännölliseen sekä huonoon hyväksikäyttöön ja osa huonoon energian tuottoon tai tunteiden passivoivaan vaikutukseen.

*Pohdinta ja johtopäätökset.* Tutkimus vahvisti IZOF-mallin oletuksia, jotka koskivat tunteiden sisältöä ja intensiteettiä, ja laajensi suoritustunteiden tutkimusta ajalliseen ulottuvuuteen. Käsitteellisesti tutkimuksessa siirryttiin ahdistustutkimuksesta käsittelemään laajempaa positiivisten ja negatiivisten tuntei-

den joukkoa. Tulokset tukivat selkeästi IZOF-mallin ehdottamaa neljää tunne-kategoriaa. Metodologisesti tutkimus osoitti, että yksilösuuntautunut tunneprofilointimenetelmä on käytännöllinen ja luotettava työväline suoritustunteiden tutkimiseen huippu-urheilukontekstissa. Menetelmä tarjoaa vaihtoehdon standardoiduille tunnemittareille. Samalla tutkimus näytti, että idiograafinen lähestymistapa avaa uusia näkökulmia ja mahdollisuuksia tutkia suoritukseen liittyviä tuntemuksia. Kaiken kaikkiaan IZOF-malli osoittautui teoreettisesti, käsitteellisesti ja metodologisesti lupaavaksi viitekehikseksi, jonka avulla pystytään kuvaamaan, ennustamaan ja selittämään multidimensionaalista yhteyttä urheilusuorituksen ja tunteiden välillä. Mallin oletukset ovat kuitenkin edelleen rajoittuneet melko suppealle alueelle ja jättävät huomioimatta tärkeitä kysymyksiä. On selvítettävä paremmin esimerkiksi emootioiden, kognition ja motivaation välinen vuorovaikutus, ennen kuin tunteiden ja suorituksen välinen yhteys pystytään tarkasti kuvaamaan. Tutkimus paljasti myös muutamia metodologisia kehittämiskohteita, jotka on syytä ottaa huomioon tulevissa tutkimuksissa. Esimerkiksi jos tunteen intensiteettitaso määritellään vain onnistuneelle tai epäonnistuneelle suoritukselle, jää epäselväksi, miten tunne vaikuttaa suoritukseen, jos intensiteetti kohoaa optimaalisen tai dysfunktionaalisen tason yläpuolelle tai se jää niiden alapuolelle. Tulevissa tutkimuksissa tunteen vaikutus suoritukseen kannattaisi määritellä koko intensiteettiskaalalle minimaalisesta maksimaaliseen.

Tutkimuksen pohjalta voidaan ehdottaa muutamia käytäntöön soveltuvia johtopäätöksiä joukkuelajien valmentajille ja urheilijoille. Havaittu tunnekoekemusten erilaisuus pelaajien välillä hankaloittaa valmentajien työskentelyä joukkueessa. Valmentajan tulisi pystyä luomaan valmennusilmapiiri, jossa kaikkien yksilöiden tarpeet ja tavat huomioitaisiin. Valmentajat tarvitsevat uudenlaisia työvälineitä, joista yksi voisi olla tutkimuksessa käytetty tunneprofilointimenetelmä. Menetelmä näyttäisi olevan tehokas tapa lisätä pelaajien tietoisuutta omista suoritusten kannalta hyödyllisistä ja haitallisista tunteistaan. Tutkimus osoitti, että pelaajien tietoisuus omista tunteistaan muuttuu kokemusten karttuessa.

IZOF-mallin sisällä-ulkona -periaate sekä tunteiden jakaminen hyödyllisiin ja haitallisiin luovat toimintamallin, jonka avulla urheilijat voivat havainnoida, ennustaa ja kontrolloida tunteitaan. Urheilijalle hyödylliset tunteet toimivat esimerkkinä siitä tunnetilasta, johon hänen tulee pyrkiä valmistautumisen ja suorituksen aikana. Haitalliset tunteet sen sijaan ovat urheilijalle tehokkaita indikaattoreita, jotta tunteen häiritsevä vaikutus suoritukseen voitaisiin ennaltaehkäistä.

Jotta joukkueessa pystyttäisiin ottamaan huomioon pelaajien yksilöllisiä erityisvaatimuksia, kuten esimerkiksi erilaisia tunnetiloja, tulee valmennusilmapiiriin tukea yksilöllisten toimintatapojen käyttöä. Tämä on mahdollista vain, jos valmentajan ja pelaajan henkilökohtainen vuorovaikutus ja kommunikointi on avointa ja valmennuksessa keskeistä. Jokaisen joukkueen jäsenen tulee sitoutua ja ottaa vastuuta omasta toiminnastaan. Lisäksi valmentajien on hyvä olla tietoisia jokaisen pelaajan henkilökohtaisista toimintatavoista. Valmentajien tulee myös ymmärtää, että mahdolliset omat kokemukset urheilijana ovat hyödyllisiä, mutta ne eivät välttämättä sovi kaikille valmennettaville. Mikäli val-

mentaja vaatii itselleen sopivaa ja tehokasta mielentilaa myös urheilijalta, saattaa valmentajan toiminta olla kyseiselle urheilijalle merkityksetöntä tai jopa häiritsevää. Samoin pelaajien kannattaa tiedostaa, että joukkueessa on erilaisia yksilöitä, jotka kaikki vaativat erilaisia toimintatapoja yltääkseen parhaaseen suoritukseensa. Eri pelaajilla on erilaisia rutiineja esimerkiksi tavassa valmistautua otteluun. Tunnetilojen herättämiseksi, kontrolloimiseksi tai muuttamiseksi on keskeistä tiedostaa, miten esimerkiksi lepo, ravinto, sosiaalinen ympäristö (koti, ystävät), lämmittely tai alkuverryttely vaikuttavat pelaajien tunteisiin valmistautumisen yhteydessä.

Tulevaisuudessa voitaisiin tarkastella muitakin urheilijoiden yksilöllisiä ominaisuuksia kuin tunnetiloja. Tarkastelun kohteena voisi olla esimerkiksi suorituksen kannalta hyödyllisiä ja haitallisia piirteitä, jotka liittyvät pelaajien motivaatioon, keskittymiseen, kehon tuntemukseen, motoriseen taitoon tai vaikka tapoihin pelata yhteen muiden kanssa.

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## Appendix 1

## Participants of the psychological preparation program in each camp

| Player | The camps for the first team |                 |                |    |                |                |                |    |    |    |                 | Total | Player | The camps for the second team |                |    |                |                |                |                |                |    |                |    | Total |
|--------|------------------------------|-----------------|----------------|----|----------------|----------------|----------------|----|----|----|-----------------|-------|--------|-------------------------------|----------------|----|----------------|----------------|----------------|----------------|----------------|----|----------------|----|-------|
|        | 1                            | 2               | 3              | 4  | 5              | 6              | 7              | 8  | 9  | 10 | 11              |       |        | 1                             | 2              | 3  | 4              | 5              | 6              | 7              | 8              | 9  | 10             |    |       |
| P1     | x <sup>1</sup>               |                 |                |    |                |                |                |    |    |    |                 | 1     | P39    |                               |                |    |                |                |                |                |                |    | x              | 2  |       |
| P2     | x <sup>1</sup>               | x <sup>2</sup>  |                |    | x <sup>3</sup> | x              |                | x  |    |    | x               | x     | 7      | P40                           |                |    |                |                | x              | x <sup>1</sup> | x              | x  | x              | 5  |       |
| P3     | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              | x              |    | x  | x  | x               | 10    | P41    |                               |                |    | x <sup>1</sup> |                |                |                |                |    |                | 1  |       |
| P4     | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              | x              | x  |    |    |                 | 8     | P42    |                               |                |    |                |                |                |                |                |    | x              | 1  |       |
| P5     | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  |                |                | x <sup>3</sup> |    |    |    | x               | x     | 7      | P43                           |                |    |                |                | x <sup>1</sup> | x              | x              | x  | x              | 5  |       |
| P6     | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              |                |    |    | x  | x               | x     | 9      | P44                           | x <sup>1</sup> | x  | x              | x              | x              |                | x              |    |                | 6  |       |
| P7     | x <sup>1</sup>               |                 |                |    |                |                |                |    |    |    | x               |       | 2      | P45                           |                |    |                |                | x <sup>1</sup> | x              | x              | x  | x              | 6  |       |
| P8     | x <sup>1</sup>               | x <sup>2</sup>  | x              |    |                |                | x <sup>3</sup> | x  |    |    |                 | 5     | P46    |                               |                |    |                |                | x <sup>1</sup> | x              | x              | x  | x              | 6  |       |
| P9     | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              |                |    |    |    | x               | x     | 8      | P6                            | x              | x  | x              | x              | x              | x              | x              | x  | x              | 9  |       |
| P10    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              | x              | x  | x  | x  | x               | 11    | P47    |                               |                |    |                |                |                | x              | x <sup>1</sup> |    |                | 2  |       |
| P11    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  |                |                | x              | x  |    |    | x               | x     | 9      | P8                            | x              | x  | x              | x              | x              |                |                |    |                | 6  |       |
| P12    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              | x              | x  | x  | x  | x               | 11    | P48    | x <sup>1</sup>                | x              | x  | x              | x              | x              | x              | x              | x  | x              | 10 |       |
| P13    | x <sup>1</sup>               |                 |                |    |                |                |                |    |    |    |                 | 1     | P32    | x                             | x              | x  | x              | x              | x              | x              | x              | x  | x              | 9  |       |
| P14    | x <sup>1</sup>               |                 | x              | x  | x <sup>2</sup> |                | x              | x  |    |    | x               | x     | 8      | P49                           | x <sup>1</sup> | x  | x              | x              | x              | x              | x              | x  |                | 8  |       |
| P15    | x <sup>1</sup>               |                 |                |    |                |                |                |    |    |    |                 | 2     | P50    | x <sup>1</sup>                |                |    |                |                |                |                |                |    |                | 1  |       |
| P16    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  |                |                | x              |    |    |    | x               | x     | 7      | P51                           | x <sup>1</sup> | x  | x              | x              | x              |                |                |    |                | 5  |       |
| P17    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              | x              | x  | x  |    |                 | x     | 10     | P52                           | x <sup>1</sup> | x  | x              | x              | x              |                |                | x  | x              | x  | 8     |
| P18    | x <sup>1</sup>               |                 |                |    |                |                |                |    |    |    |                 | 1     | P53    | x <sup>1</sup>                | x              |    |                |                |                |                |                |    |                | 2  |       |
| P19    | x <sup>1</sup>               |                 | x              |    | x <sup>2</sup> | x              | x              | x  |    |    |                 | x     | 7      | P54                           |                |    |                | x <sup>1</sup> | x              | x              |                |    |                | 3  |       |
| P20    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  |                |                |                |    |    | x  | x               | x     | 7      | P55                           |                |    |                |                |                |                |                |    | x <sup>1</sup> | x  | 2     |
| P21    | x <sup>1</sup>               | x <sup>2</sup>  |                |    |                |                |                |    |    |    |                 | 3     | P56    | x <sup>1</sup>                |                |    |                |                |                |                |                |    |                | 1  |       |
| P22    | x <sup>1</sup>               | x <sup>2</sup>  |                |    |                |                | x              |    |    |    |                 | 2     | P57    |                               | x <sup>1</sup> | x  | x              | x              | x              | x              | x              |    |                | 7  |       |
| P23    | x <sup>1</sup>               |                 |                |    |                |                | x <sup>2</sup> | x  |    |    | x               | 4     | P58    | x <sup>1</sup>                | x              | x  | x              |                | x              | x              | x              |    | x              | 8  |       |
| P24    | x <sup>1</sup>               | x <sup>2</sup>  | x              | x  | x <sup>3</sup> | x              |                |    |    | x  | x               | 8     | P19    | x                             | x              | x  | x              |                |                |                |                |    |                | 4  |       |
| P25    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | x     | 2      | P15                           | x              | x  | x              | x              | x              |                | x              | x  |                | 8  |       |
| P26    |                              | x <sup>1</sup>  | x              | x  | x <sup>2</sup> | x              | x              |    |    |    | x               | x     | 9      | P59                           | x <sup>1</sup> | x  | x              | x              | x              | x              | x              | x  |                | 8  |       |
| P27    |                              | x <sup>1</sup>  | x              | x  |                | x              | x <sup>2</sup> | x  | x  | x  | x               | 9     | P60    |                               |                |    |                |                |                |                |                |    |                | x  | 1     |
| P28    |                              |                 | x <sup>1</sup> | x  | x <sup>2</sup> | x              | x              |    |    |    | x               | 6     | P61    |                               |                |    |                | x <sup>1</sup> | x              | x              | x              | x  |                | 5  |       |
| P29    |                              |                 | x <sup>1</sup> |    |                |                | x <sup>2</sup> |    |    |    | x               | x     | 4      | P62                           |                |    |                |                |                | x <sup>1</sup> |                |    | x              | x  | 3     |
| P30    |                              |                 |                |    |                | x <sup>1</sup> | x <sup>2</sup> | x  | x  |    |                 | 4     | P30    | x                             | x              | x  | x              |                |                | x              | x              | x  |                | 8  |       |
| P31    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | 1     | P63    |                               |                |    |                |                |                | x              | x <sup>1</sup> | x  | x              | 5  |       |
| P32    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | 1     | P64    |                               |                |    |                |                |                | x <sup>1</sup> | x              | x  | x              | 5  |       |
| P33    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | x     | 4      | P65                           | x <sup>1</sup> | x  | x              | x              | x              |                |                |    | x              | 6  |       |
| P34    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | x     | 2      | P66                           |                |    |                |                |                |                | x              |    | x <sup>1</sup> | 2  |       |
| P35    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | 1     | P67    | x <sup>1</sup>                | x              | x  | x              | x              |                |                |                |    | x              | x  | 7     |
| P36    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1</sup>  | 1     | P21    |                               |                |    |                |                |                |                |                |    | x              | 1  |       |
| P37    |                              |                 |                |    |                |                |                |    |    |    | x <sup>1?</sup> | x     | 2      | P68                           |                |    |                |                |                |                |                |    |                | x  | 1     |
| P38    |                              | x <sup>1?</sup> |                |    |                |                |                |    |    |    |                 | 1     |        |                               |                |    |                |                |                |                |                |    |                |    |       |
| Total  | 25                           | 18              | 19             | 16 | 13             | 17             | 22             | 15 | 12 | 19 | 18              |       | Total  | 18                            | 17             | 16 | 17             | 23             | 19             | 18             | 17             | 15 | 17             |    |       |

Note. x<sup>1</sup> - first emotion profile assessment,  
x<sup>2</sup> - second emotion profile assessment,  
x<sup>3</sup> - third emotion profile assessment

x<sup>1?</sup> - first emotion profile assessment with some misunderstandings  
Note. Twenty-five players in the present sample have also been participants in two other recent studies (Hanin & Syrjä, 1995b, 1996).

## Appendix 2

The Finnish version of Hanin's stimulus list of emotion descriptions

## VIRIKELISTAT

Alapuolella listassa on lueteltu tavallisia positiivisia ja negatiivisia adjektiiveja, jotka kuvaavat melko tyypillisiä tuntemuksia urheilussa. Näitä luetteloita tai omia adjektiiveja hyväksikäyttäen, valitse henkilökohtaiseen lomakkeeseesi a) 4-5 positiivista (P+) ja 4-5 negatiivista (N+) adjektiivia, jotka kuvaavat tunteita sinulle tyypillisessä onnistuneessa suorituksessa, sekä b) 4-5 positiivista (P+) ja 4-5 negatiivista (N+) adjektiivia, jotka kuvaavat tunteita sinulle tyypillisessä epäonnistuneessa suorituksessa. Määrittele lisäksi henkilökohtaisen lomakkeen reunassa olevan asteikon avulla jokaiselle hyödylliselle tunteelle (P+ ja N+) optimaalinen intensiteetti sekä haitalliselle tunteelle (P- ja N-) epäoptimaalinen intensiteetti.

## POSITIIVISET ADJEKTIIVIT

1. eloisa, pirteä, vilkas
2. energinen, tarmokas, vireä
3. halukas, innokas
4. huoleton, suruton, vapaa
5. hurmioitunut, iki-ihastunut
6. hyvä, kiva, miellyttävä
7. hyväntuulinen, iloinen, onnellinen, tyytyväinen
8. innostunut, motivoitunut
9. jännittänyt, latautunut, virittänyt
10. levännyt, mukava, rentoutunut
11. levollinen, rauhallinen, tyyni
12. luottavainen, varma
13. määrätietoinen, päättäväinen, varma
14. peloton, rohkea, uskalias
15. rivakka, sähköinen

## NEGATIIVISET ADJEKTIIVIT

1. ahdistunut
2. allapäin, apea, masentunut
3. epätietoinen, epävarma, neuvoton
4. haluton, laiska, velto
5. hermostunut, levoton, rauhaton
6. huolestunut, hätäntynyt
7. hyökkäävä, raivostunut, suuttunut, vihainen
8. jännittänyt, kireä, pingottunut
9. kiihkeä, kiivas
10. murheellinen, onneton, surullinen
11. närkästynyt, ärsyyntynyt, ärtynyt
12. nääntynyt, uupunut, väsynyt
13. pelokas, kauhistunut, säikähtänyt
14. tyytymätön

## Appendix 3

The form for the individual emotion profile, task-related emotion intensity and performance measurements (Finnish version)

Nimi: \_\_\_\_\_ Ikä: \_\_\_\_\_ Pvm: \_\_\_\_\_  
Ajankohta: \_\_\_\_\_

## SUORITUKSEEN LIITTYVÄT TUNTEMUKSET

| Asteikko             | Tuntemusten intensiteetti |       |   |     |   |   |   |   |   |   |   |   |   |    |   |
|----------------------|---------------------------|-------|---|-----|---|---|---|---|---|---|---|---|---|----|---|
| 0 - ei yhtään        | P+ 1                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 0.5 - erittäin vähän | P+ 2                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 1 - melko vähän      | P+ 3                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 2 - vähän            | P+ 4                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 3 - kohtuullisesti   | P+ 5                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 4 - keskimääräisesti | N+ 1                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 5 - paljon           | N+ 2                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 6 -                  | N+ 3                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 7 - hyvin paljon     | N+ 4                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 8 -                  | N+ 5                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 9 -                  | P- 1                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| 10 - erittäin paljon | P- 2                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
| # - maksimaalinen    | P- 3                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | P- 4                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | P- 5                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | N- 1                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | N- 2                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | N- 3                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | N- 4                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |
|                      | N- 5                      | _____ | 0 | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | # |

## SUORITUKSEN ONNISTUMISEN ARVIOINTI

|                   |       |        |        |      |   |   |   |   |   |   | Asteikko             |    |   |                     |
|-------------------|-------|--------|--------|------|---|---|---|---|---|---|----------------------|----|---|---------------------|
| Minun pelini oli: | huono | kesk - | kesk + | hyvä |   |   |   |   |   |   | 0 -                  |    |   |                     |
|                   |       |        |        |      |   |   |   |   |   |   | 0.5 - erittäin huono |    |   |                     |
|                   |       |        |        |      |   |   |   |   |   |   | 1 - hyvin huono      |    |   |                     |
|                   |       |        |        |      |   |   |   |   |   |   | 2 - huono            |    |   |                     |
| Laatu:            | 0     | 0.5    | 1      | 2    | 3 | 4 | 5 | 6 | 7 | 8 | 9                    | 10 | # | 3 - alle keskitason |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 4 - keskinkertainen |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 5 - yli keskitason  |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 6 -                 |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 7 - oikein hyvä     |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 8 -                 |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 9 -                 |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | 10 - erittäin hyvä  |
|                   |       |        |        |      |   |   |   |   |   |   |                      |    |   | # - loistava        |
| Kommentit:        | _____ |        |        |      |   |   |   |   |   |   |                      |    |   |                     |
|                   | _____ |        |        |      |   |   |   |   |   |   |                      |    |   |                     |
|                   | _____ |        |        |      |   |   |   |   |   |   |                      |    |   |                     |
|                   | _____ |        |        |      |   |   |   |   |   |   |                      |    |   |                     |

## Appendix 4

Task-related situational emotion intensity measurements in each game

| Player | Emotion scale <sup>1)</sup> | Game 1          |     | Game 2 |   | Game 3 |   | Game 4 |   | 1234567         |    |   |   |   |   |  |  |       |    |
|--------|-----------------------------|-----------------|-----|--------|---|--------|---|--------|---|-----------------|----|---|---|---|---|--|--|-------|----|
|        |                             | 1               | 2   | 3      | 4 | 5      | 6 | 7      | 1 | 2               | 3  | 4 | 5 | 6 | 7 |  |  |       |    |
| 2      | second                      | <u>xxxxxxxx</u> |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 2      | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 3      | second                      | <u>xxxxxxxx</u> |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 3      | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 4      | second                      | xx              |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 4      | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  | xx    | x  |
| 5      | second                      | xxxxxx          | x   |        |   |        |   |        |   | xx              |    |   |   |   |   |  |  |       |    |
| 6      | second                      | xxxxx           | x   |        |   |        |   |        |   | xx              |    |   |   |   |   |  |  |       |    |
| 6      | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 8      | second                      | xx              | xxx |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 9      | second                      | xxxxx           | x   |        |   |        |   |        |   | <u>xxxxxxxx</u> |    |   |   |   |   |  |  |       |    |
| 9      | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 10     | second                      | <u>xxxxxxxx</u> |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 10     | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 11     | second                      | xxxxxx          | x   |        |   |        |   |        |   | <u>xxxxxxxx</u> |    |   |   |   |   |  |  |       |    |
| 12     | second                      | <u>xxxxxxxx</u> |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 12     | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 14     | first                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 16     | second                      | <u>xxxxxxxx</u> |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 17     | second                      | xx              | xxx |        |   |        |   |        |   | <u>xxxxxxxx</u> |    |   |   |   |   |  |  |       |    |
| 19     | first                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 19     | second                      |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 20     | second                      | xxxxxx          | x   |        |   |        |   |        |   | <u>xxxxxxxx</u> |    |   |   |   |   |  |  | xx    | xx |
| 21     | second                      | xx              | xxx |        |   |        |   |        |   |                 |    |   |   |   |   |  |  | xx    | x  |
| 22     | second                      | x               | xx  |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 24     | second                      | xxxxxx          | x   |        |   |        |   |        |   | xx              | xx |   |   |   |   |  |  |       |    |
| 24     | third                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 26     | first                       | xx              | xx  |        |   |        |   |        |   | <u>xxxxxxxx</u> |    |   |   |   |   |  |  |       |    |
| 26     | second                      |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 27     | first                       | xx              | xxx |        |   |        |   |        |   | xx              |    |   |   |   |   |  |  | xxxxx | x  |
| 28     | first                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 28     | second                      |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |
| 29     | first                       |                 |     |        |   |        |   |        |   |                 |    |   |   |   |   |  |  |       |    |

<sup>1)</sup> The number of the scale

- <sup>2)</sup>
- 1 – current 24 hours before the game
  - 2 – prediction made 24 hours earlier for just before the game
  - 3 – recalled during first part of first half
  - 4 – recalled during second part of first half
  - 5 – recalled during first part of second half
  - 6 – recalled during second part of second half
  - 7 – current 30 minutes after the game

Note. Underlined measurements were taken for analysis of task-related situational emotion patterns

## Appendix 5

The form for the answers to the open-ended questions (Finnish version)

Nimi:

pvm:

Kirjaa omat HYÖDYLLISET  
tunteet allaoleville viivoille.

Perustele miksi ja miten kyseinen tunne on  
sinulle HYÖDYLLINEN

Positiiviset

Miksi ja Miten?

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

Negatiiviset

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

Kirjaa omat HAITALLISET  
tunteet allaoleville viivoille.

Perustele miksi ja miten kyseinen tunne on  
sinulle HAITALLINEN

Positiiviset

Miksi ja Miten?

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

Negatiiviset

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_

\_\_\_\_\_

Appendix 6

Self-rated performance ratios for total task execution (Total) and for each during-game part (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>)

| Player | Game 1: Finland-England 2-0 |                 |                 |                 | Game 2: Finland-Sweden 1-4 |       |                 |                 | Game 3: Finland-Scotland 1-0 |                 |       |                 | Game 4: Finland-San Marino 4-0 |                 |                 |     |     |
|--------|-----------------------------|-----------------|-----------------|-----------------|----------------------------|-------|-----------------|-----------------|------------------------------|-----------------|-------|-----------------|--------------------------------|-----------------|-----------------|-----|-----|
|        | Total                       | 1 <sup>st</sup> | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup>            | Total | 1 <sup>st</sup> | 2 <sup>nd</sup> | 3 <sup>rd</sup>              | 4 <sup>th</sup> | Total | 1 <sup>st</sup> | 2 <sup>nd</sup>                | 3 <sup>rd</sup> | 4 <sup>th</sup> |     |     |
| 2      | 6-7                         | 7               | 7               | 6               | 6-7                        |       |                 |                 |                              |                 |       |                 |                                |                 |                 |     |     |
| 3      | 7-8                         | 7               | 8-9             | 8-9             | 7-8                        | 4     | 6               | 5               | 4                            | 3               | 6-7   | 6               | 5-6                            | 5-6             | 5               | 6-7 |     |
| 4      |                             |                 |                 |                 |                            | 5-6   |                 |                 |                              |                 |       | 7-8             | 8                              | 8               | 7               | 8   |     |
| 5      | 6                           | 6               | 6               | 7               |                            | 2     | 2               | 2               |                              |                 |       |                 |                                | 5-6             | 5-6             | 5   | 5-6 |
| 6      | 7                           | 7-8             | 7-8             |                 |                            |       |                 |                 |                              |                 |       |                 |                                |                 |                 |     |     |
| 8      | 4                           |                 |                 | 7               | 3                          | 3     |                 |                 | 3                            |                 |       |                 |                                |                 |                 |     |     |
| 9      | 7-8                         | 8               | 7               |                 | 3-4                        | 3     | 3               | 3-4             | 3-4                          | 3               | 5-6   | 6               | 6                              | 5               | 5               | 5-6 | 5-6 |
| 10     | 3                           | 2               | 3               | 3               | 3                          | 3     | 4               | 5-6             | 3                            | 2               | 6     | 4               | 5                              | 5               | 5-6             | 5-6 | 5-6 |
| 11     | 5                           | 4               | 4               | 5               | 3                          | 4     | 4               | 4               | 4-5                          | 4-5             | 5-6   | 4               | 4                              | 5               | 6               | 6-7 | 3-4 |
| 12     | 8                           | 8               | 7               | 7               | 3                          | 3     | 4               | 4               | 3                            | 3               | 4     | 4               | 6                              | 4               | 4               | 4   | 4   |
| 14     |                             |                 |                 |                 | 4                          | 4     | - <sup>1)</sup> | -               | -                            | -               | 9     | 9               | 9                              | 1               | ?               | ?   | 8   |
| 16     | 6-7                         | 6               | 6               | 6               | 7                          | 3     | 7               | 8               | 3                            | 2-3             | 8     | 8               | 8                              | 8               | 8               | 7   | 7   |
| 17     | 4                           |                 |                 | 3               | 5                          | 4     | 4               | 4               | 5                            | 1               | 7     | 7               | 6                              | 6               | 6               | 7   | 7   |
| 19     |                             |                 |                 |                 |                            |       |                 |                 |                              |                 |       |                 |                                |                 |                 |     |     |
| 20     | 4-5                         | 5               | 5               | 5               | 5                          | 3     | 4               | 4               | 3                            | 3               | 8     | 8               | 7-8                            | 8               |                 |     | 2   |
| 21     | 8                           |                 |                 | 6               | 9                          |       |                 |                 |                              |                 |       |                 |                                |                 |                 |     | 2   |
| 22     | 6                           |                 |                 | 6               | 6                          |       |                 |                 |                              |                 |       |                 |                                |                 |                 |     | 2   |
| 24     | 4                           | 4               | 5               | 3               | 5-6                        | 4     | 4               | 4               | 4                            | 4               | 4     | 6-7             | 6                              | 6-7             | 6-7             | 4-5 | 4   |
| 26     | 5-6                         |                 |                 | 4               |                            | 4     |                 |                 |                              |                 | 4     | 3-4             | 6                              | 6-7             | 6-7             | 4-5 | 4   |
| 27     | 4                           |                 |                 | 4               |                            |       |                 |                 |                              |                 | 4     | 3-4             | 3-4                            | 4               | 4               | 4-5 | 4   |
| 28     |                             |                 |                 |                 |                            |       |                 |                 |                              |                 |       |                 |                                |                 |                 |     |     |
| 29     |                             |                 |                 |                 |                            | 6     |                 |                 |                              | 6               | 4     | 3-4             | 3-4                            | 4               | 4               | 5-6 | 5-6 |

<sup>1)</sup> Player participated in the game but did not for some reason self-rate his performance level  
 Note: Self-rated performance ratios were collected using recalled assessments 30 minutes after the game  
 Note: The measures were conducted using the following questions: 1 = What was your performance level during the first part of the first half; 2 = What was your performance level during the second part of the first half; 3 = What was your performance level during the first part of the second half; and 4 = What was your performance level during the second part of the second half.  
 Note: If the player used two numbers (e.g. 6-7) to indicate his performance level, the median was taken (e.g. 6.5)



## Appendix 7

## Sample size to each main research problem

| Research problem  | Team 1<br>N of<br>players | Team 2<br>N of<br>players |
|---|---------------------------|---------------------------|
| A. The content of emotions, and   |                           |                           |
| B. Optimal and dysfunctional intensity zones  |                           |                           |
| Initial assessment  | 37                        | 27                        |
| Second assessment   | 24                        | -                         |
| Third assessment  | 11                        | -                         |
| C. Task-related situational emotion patterns (all situations <sup>1)</sup> )        | 14                        | -                         |
| D. Effect of emotion upon performance   |                           |                           |
| In-out of the zone principle  |                           |                           |
| Task-related situational emotion intensities and<br>optimal and dysfunctional zones | 22                        | -                         |
| Performance measure   | 22                        | -                         |
| Functional meaning of the impact of emotion<br>on performance                       | -                         | 17                        |

<sup>1)</sup> The players who had task-related emotion measurements in all seven situations

## Appendix 8

## The list of variables of the study

## Measurement

- Measurable variable
- Scaling instrument
- Operational variable
- Sub-variable
- Sum-variable

## Emotion measures

## The content of emotion

- Stimulus list of emotion descriptions (40 positive and 37 negative adjectives, or own word)
  - Emotion description related to typical successful and unsuccessful performance
    - Positive optimal (P+) emotion description
    - Negative optimal (N+) emotion description
    - Positive dysfunctional (P-) emotion description
    - Negative dysfunctional, harmful (N-) emotion description
      - The list of adjectives in P+ category
      - The list of adjectives in N+ category
      - The list of adjectives in P- category
      - The list of adjectives in N- category
      - The list of adjectives in P+ and in N+ category (joint P+N+)
      - The list of adjectives in P- and in N- category (joint P-N-)
      - The list of adjectives in all four emotion categories (joint P+N+P-N-)

## The intensity of emotion

- Borg's CR-10 scale
  - Intensity zone related to typical successful and unsuccessful performance
    - Optimal intensity zone of each single helpful positive (P+) and negative (N+) emotion description
    - Dysfunctional intensity zone of each single harmful positive (P-) and negative (N-) emotion description
  - Task-related situational emotion intensity
    - Situational intensity (anticipated, current, or recalled) of each single positive and negative adjective
      - m P+ = median of task-related intensities of the P+ emotions
      - m N+ = median of task-related intensities of the N+ emotions
      - m P- = median of task-related intensities of the P- emotions
      - m N- = median of task-related intensities of the N- emotions
      - m P+N+ = median of task-related intensities of the joint P+N+ emotions
      - m P-N- = median of task-related intensities of the joint P-N- emotions
      - m P+N+P-N- = median of task-related intensities of all emotions
  - Emotion deviations (player's situational intensity from his optimal or dysfunctional zone)
    - Deviation of each single positive and negative adjective
      - d P+ = mean of absolute deviations of positive optimal emotions
      - d N+ = mean of absolute deviations of negative optimal emotions

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continues

## Appendix 8 (continues)

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 Measurement

- Measurable variable
  - Scaling instrument
    - Operational variable
      - Sub-variable
        - Sum-variable

---

d P- = mean of absolute deviations of positive dysfunctional emotions

d N- = mean of absolute deviations of negative dysfunctional emotions

d P+N+ = mean of absolute deviations of all optimal emotions

d P+N+ = mean of absolute deviations of all dysfunctional emotions

d P+N+P-N- = [(d(P-) + d(N-)) - [d(P+) + d(N+)]]

Functional meaning of the impact of emotion on performance

Open-ended statements

- Why is emotion helpful for you?
- Why is emotion harmful for you?

Performance measures

- Level of performance
    - Borg's CR-10 scale
      - Subjective self-rated performance ratio
        - total level
        - first partial level (1/1ht)
        - second partial level (2/1ht)
        - third partial level (1/2ht)
        - fourth partial level (2/2ht)
-

## Appendix 9

The number of the players (N), and median and range levels of optimal and dysfunctional zones for *positive emotion descriptions* (n = 62)

| Emotion descriptions                            | Positive optimal (P+) |        |       | Positive dysfunctional (P-) |        |       |
|---|-----------------------|--------|-------|-----------------------------|--------|-------|
|   | N<br>%                | Median | Range | N<br>%                      | Median | Range |
| charged (latautunut)                            | 44                    | 8.0    | 6     |                             |        |       |
| motivated (motivoitunut)                        | 34                    | 8.0    | 6     |                             |        |       |
| reactive (sähkökä)                              | 26                    | 7.3    | 6     |                             |        |       |
| determined (määrätietoinen)                     | 21                    | 7.5    | 7     |                             |        |       |
| brave (rohkea)                                  | 19                    | 6.8    | 7     |                             |        |       |
| resolute (päätäväinen)                          | 18                    | 8.0    | 6     |                             |        |       |
| active (vireä)                                  | 5                     | 7.0    | 5     |                             |        |       |
| focused (keskittynyt) <sup>a)</sup>             | 2                     | 5.5    | 3     |                             |        |       |
| sharp (terävä) <sup>a)</sup>                    | 2                     | 6.5    | 3     |                             |        |       |
| easy-going (rento) <sup>a)</sup>                | 2                     | 4.0    | 2     |                             |        |       |
| energetic (energinen)                           | 47                    | 8.0    | 6     | 3                           | 6.5    | 5     |
| confident (luottavainen)                        | 40                    | 8.5    | 6     | 3                           | 4.5    | 7     |
| willing (halukas)                               | 29                    | 8.0    | 9     | 2                           | 4.0    | 0     |
| rested (levännyt)                               | 23                    | 5.8    | 6     | 3                           | 5.5    | 1     |
| certain (varma)                                 | 19                    | 8.0    | 7     | 11                          | 3.0    | 6.5   |
| enthusiastic (innostunut)                       | 18                    | 6.0    | 5     | 2                           | 5.0    | 0     |
| fearless (peloton)                              | 16                    | 7.5    | 6     | 13                          | 5.5    | 8     |
| cheerful (hyväntuulinen)                        | 11                    | 6.0    | 6     | 5                           | 2.5    | 4     |
| relaxed (rentoutunut)                           | 11                    | 7.0    | 5     | 7                           | 4.0    | 8     |
| carefree (huoleton)                             | 11                    | 7.0    | 5     | 40                          | 7.0    | 9.5   |
| alert (pirteä)                                  | 10                    | 7.3    | 4     | 3                           | 6.0    | 8     |
| peaceful (rauhallinen)                          | 10                    | 8.3    | 6     | 8                           | 5.0    | 8     |
| stimulated (virittynyt)                         | 7                     | 7.5    | 5     | 2                           | 8.0    | 0     |
| daring (uskalias)                               | 7                     | 8.5    | 6     | 3                           | 8.5    | 1     |
| glad (iloinen)                                  | 5                     | 9.0    | 5     | 2                           | 3.0    | 0     |
| brisk (rivakka)                                 | 5                     | 8.0    | 3     | 2                           | 2.0    | 0     |
| satisfied (tyytyväinen)                         | 5                     | 7.0    | 1     | 29                          | 7.0    | 10    |
| eager (innokas)                                 | 3                     | 7.0    | 0     | 3                           | 4.5    | 1     |
| calm (levollinen)                               | 3                     | 4.8    | 6     | 8                           | 5.0    | 8.5   |
| animated (vilkas)                               | 3                     | 4.3    | 2     | 16                          | 6.0    | 10    |
| vigorous (tarmokas)                             | 2                     | 6.5    | 3     | 2                           | 8.5    | 1     |
| lively (eloisa)                                 | 2                     | 1.5    | 4     | 3                           | 3.5    | 1     |
| good (hyvä)                                     | 2                     | 5.5    | 5     | 3                           | 2.5    | 1     |
| happy (onnellinen)                              | 2                     | 3.0    | 0     | 5                           | 0.5    | 7     |
| ecstatic (hurmioitunut)                         | 2                     | 6.0    | 0     | 10                          | 4.5    | 5     |
| agreeable (miellyttävä)                         | 2                     | 7.0    | 0     | 11                          | 5.0    | 8     |
| nice (kiva)                                     | 2                     | 7.0    | 0     | 13                          | 3.5    | 8     |
| overjoyed (iki-ihastunut)                       | 2                     | 7.0    | 0     | 15                          | 3.0    | 9.5   |
| tranquil (tyyni)                                | 2                     | 7.5    | 1     | 21                          | 3.0    | 8     |
| feeling too good (liian hyvä olo) <sup>a)</sup> |                       |        |       | 2                           | 5.0    | 2     |
| reckless (uhkarohkea) <sup>a)</sup>             |                       |        |       | 2                           | 8.5    | 3     |
| over-energetic (ylienerginen) <sup>a)</sup>     |                       |        |       | 2                           | 3.0    | 0     |
| free (vapaa)                                    |                       |        |       | 3                           | 1.8    | 2.5   |
| at easy (mukava)                                |                       |        |       | 21                          | 4.5    | 10    |
| light-hearted (suruton)                         |                       |        |       |                             |        |       |

<sup>a)</sup> Players own adjectives from outside the stimulus list  
Note. The word "tense (jännittynyt)" has been moved to the negative list

## Appendix 9 (continues)

The frequency (%) of the players, and median and range levels of optimal and dysfunctional zones for *negative emotion descriptions* (n = 62)

| Emotion descriptions                | Negative optimal (N+) |        |       | Negative dysfunctional (N-) |        |       |
|-------------------------------------|-----------------------|--------|-------|-----------------------------|--------|-------|
|                                     | N of player           | Median | Range | N of player                 | Median | Range |
| passionate (kiihkeä)                | 32                    | 4.0    | 7     |                             |        |       |
| indignant (närkästynyt)             | 3                     | 5.5    | 7     |                             |        |       |
| excitement (kiihtynyt) <sup>a</sup> | 2                     | 3.5    | 1     |                             |        |       |
| explosive (räjähdys) <sup>a</sup>   | 2                     | 8.0    | 0     |                             |        |       |
| tense (jännittynyt)                 | 63                    | 5.0    | 9     | 13                          | 6.5    | 8     |
| dissatisfied (tyytymätön)           | 52                    | 5.3    | 8     | 18                          | 6.0    | 7     |
| aggressive (hyökkäävä)              | 39                    | 4.5    | 9     | 2                           | 8.5    | 3     |
| intense (kiivas)                    | 27                    | 4.0    | 6     | 3                           | 5.5    | 1     |
| provoked (ärsyyntynyt)              | 27                    | 4.0    | 7     | 2                           | 4.5    | 5     |
| nervous (hermostunut)               | 21                    | 3.0    | 7     | 10                          | 7.0    | 4     |
| unsettled (rauhaton)                | 13                    | 3.0    | 4     | 7                           | 8.0    | 4     |
| irritated (ärtynyt)                 | 13                    | 7.0    | 7     | 2                           | 4.0    | 0     |
| restless (levoton)                  | 10                    | 2.5    | 3     | 8                           | 7.5    | 6     |
| uncertain (epävarma)                | 7                     | 3.0    | 4.5   | 34                          | 6.0    | 9.5   |
| concerned (huolestunut)             | 7                     | 2.0    | 4     | 11                          | 8.0    | 5     |
| uptight (kireä)                     | 7                     | 3.0    | 3     | 11                          | 6.0    | 8     |
| afraid (pelokas)                    | 5                     | 3.0    | 2     | 15                          | 6.0    | 10    |
| angry (vihainen)                    | 5                     | 5.0    | 3     | 5                           | 4.0    | 2     |
| furious (raivostunut)               | 5                     | 5.0    | 2     | 2                           | 8.0    | 2     |
| distressed (ahdistunut)             | 3                     | 4.0    | 2     | 18                          | 5.0    | 7.5   |
| annoyed (suuttunut)                 | 3                     | 4.5    | 4     | 3                           | 5.5    | 4     |
| lazy (laiska)                       | 2                     | 7.0    | 0     | 26                          | 8.0    | 9     |
| dispirited (apea)                   | 2                     | 6.0    | 0     | 7                           | 4.0    | 6     |
| frightened (säikähtynyt)            | 2                     | 3.0    | 0     | 2                           | 4.0    | 0     |
| terrified (kauhistunut)             |                       |        |       | 2                           | 5.0    | 0     |
| irresolute (neuvoton)               |                       |        |       | 5                           | 7.0    | 4     |
| weary (nääntynyt)                   |                       |        |       | 5                           | 8.0    | 2     |
| sad (surullinen)                    |                       |        |       | 7                           | 5.0    | 7     |
| alarmed (häätäntynyt)               |                       |        |       | 8                           | 5.0    | 8     |
| doubtful (epätietoinen)             |                       |        |       | 10                          | 5.5    | 3     |
| unhappy (onneton)                   |                       |        |       | 13                          | 5.0    | 7     |
| dejected (allapäin)                 |                       |        |       | 15                          | 8.0    | 8     |
| exhausted (uupunut)                 |                       |        |       | 15                          | 5.5    | 9.5   |
| sorrowful (murheellinen)            |                       |        |       | 16                          | 8.0    | 7     |
| depressed (masentunut)              |                       |        |       | 19                          | 6.0    | 9.5   |
| sluggish (veltto)                   |                       |        |       | 27                          | 7.0    | 8     |
| unwilling (haluton)                 |                       |        |       | 37                          | 7.0    | 10    |
| tired (väsynyt)                     |                       |        |       | 45                          | 5.5    | 8     |
| strained (pingottunut)              |                       |        |       |                             |        |       |

<sup>a</sup> Players own adjectives from outside the stimulus list

## Appendix 10

Optimal and dysfunctional zones of the same emotion descriptions selected by the same player for both emotion categories (n = 9)

| Player | Emotion description       | Optimal zone | Dysfunctional zone |
|--------|---------------------------|--------------|--------------------|
| 2      | fearless (peloton)        | 4-5          | 9-10               |
| 4      | intense (kiivas)          | 3            | 5                  |
| 5      | dissatisfied (tyytymätön) | 4            | 5                  |
| 21     | distressed (ahdistunut)   | 3            | 7                  |
| 22     | afraid (pelokas)          | 3            | 7-9                |
| 34     | aggressive (hyökkäävä)    | 1-3          | 7-10               |
| 74     | tense (jännittynyt)       | 2            | 4                  |
| 79     | dissatisfied (tyytymätön) | 2            | 9                  |
| 80     | tense (jännittynyt)       | 5            | 6                  |

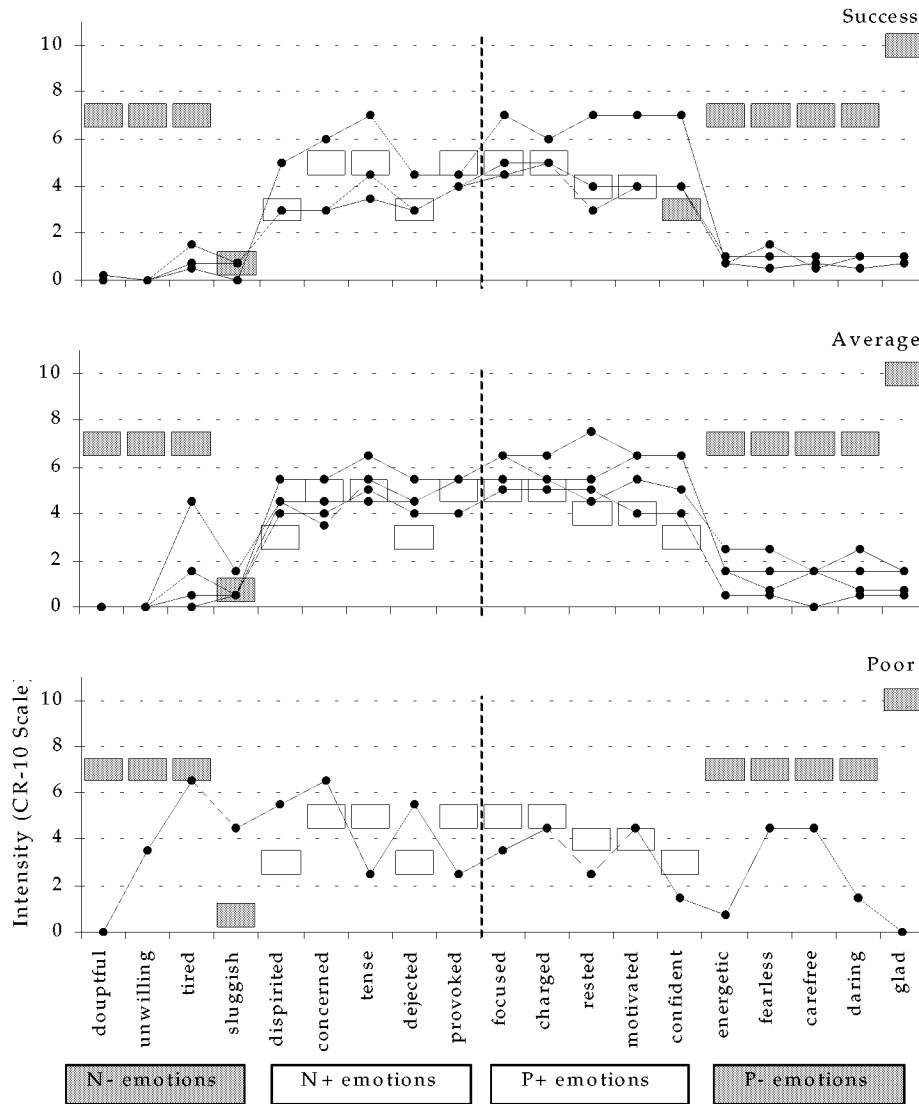
## Appendix 11

Optimal and dysfunctional zones of the same emotion description selected by the same player for functionally different emotion categories between repeated assessments (n = 10)

| Player | Emotion description       | First assessment |      | Second assessment |      | Third assessment |      |
|--------|---------------------------|------------------|------|-------------------|------|------------------|------|
|        |                           | Category         | Zone | Category          | Zone | Category         | Zone |
| 2      | unsettled (rauhaton)      |                  |      | N-                | 5-6  | N+               | 0-2  |
| 4      | aggressive (hyökkäävä)    | N+               | 4    |                   |      | N-               | 5    |
| 4      | willing (halukas)         | P-               | 4    |                   |      | P+               | 9    |
| 4      | fearless (peloton)        | P+               | 4    | P+                | 7    | P-               | 4    |
| 8      | nice (kiva)               | P-               | 4    | P+                | 5-7  |                  |      |
| 8      | cheerful (hyväntuulinen)  |                  |      | P-                | 7    | P+               | 5-7  |
| 12     | uptight (kireä)           | N-               | 4    |                   |      | N+               | 7    |
| 12     | afraid (pelokas)          | N+               | 4-5  | N-                | 6    |                  |      |
| 14     | relaxed (rentoutunut)     | P+               | 3-5  | P-                | 7-10 |                  |      |
| 19     | irritated (ärtynyt)       | N-               | 4    | N+                | 5    |                  |      |
| 21     | distressed (ahdistunut)   | N-               | 7    | N+                | 3-5  |                  |      |
| 21     | afraid (pelokas)          | N-               | 7-9  | N+                | 5    |                  |      |
| 26     | energetic (energinen)     | P+               | 5    | P-                | 3    |                  |      |
| 29     | confident (luottavainen)  | P-               | 1    | P+                | 7    |                  |      |
| 30     | dissatisfied (tyytymätön) | N-               | 3    | N+                | 3-6  |                  |      |

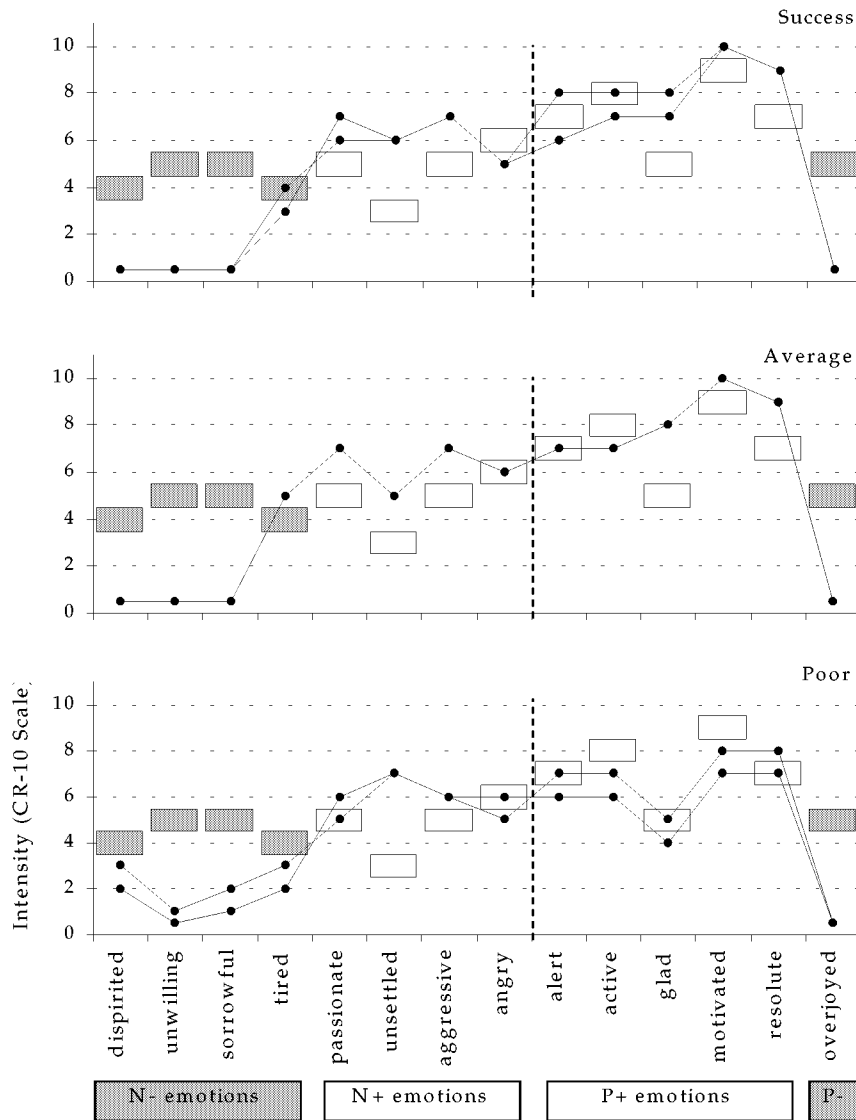
Appendix 12

Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 3* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)



Appendix 12 (continues)

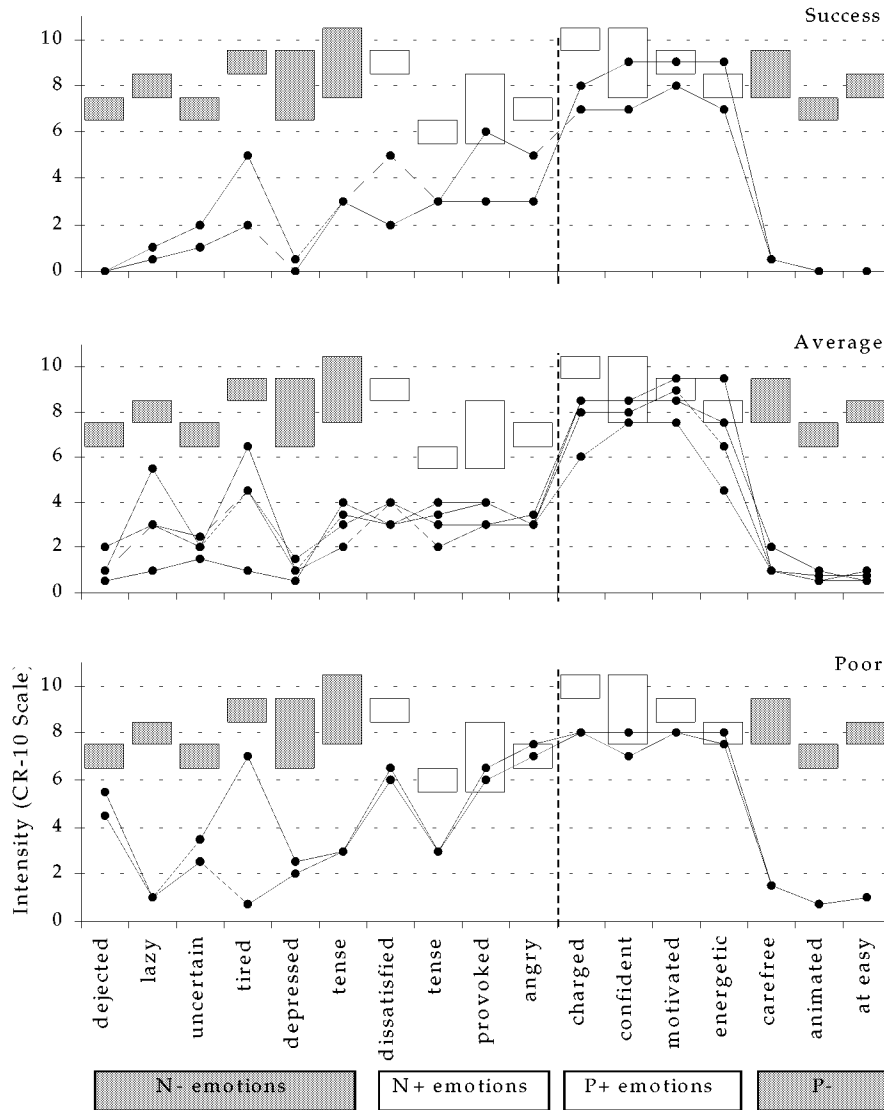
Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 5* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)





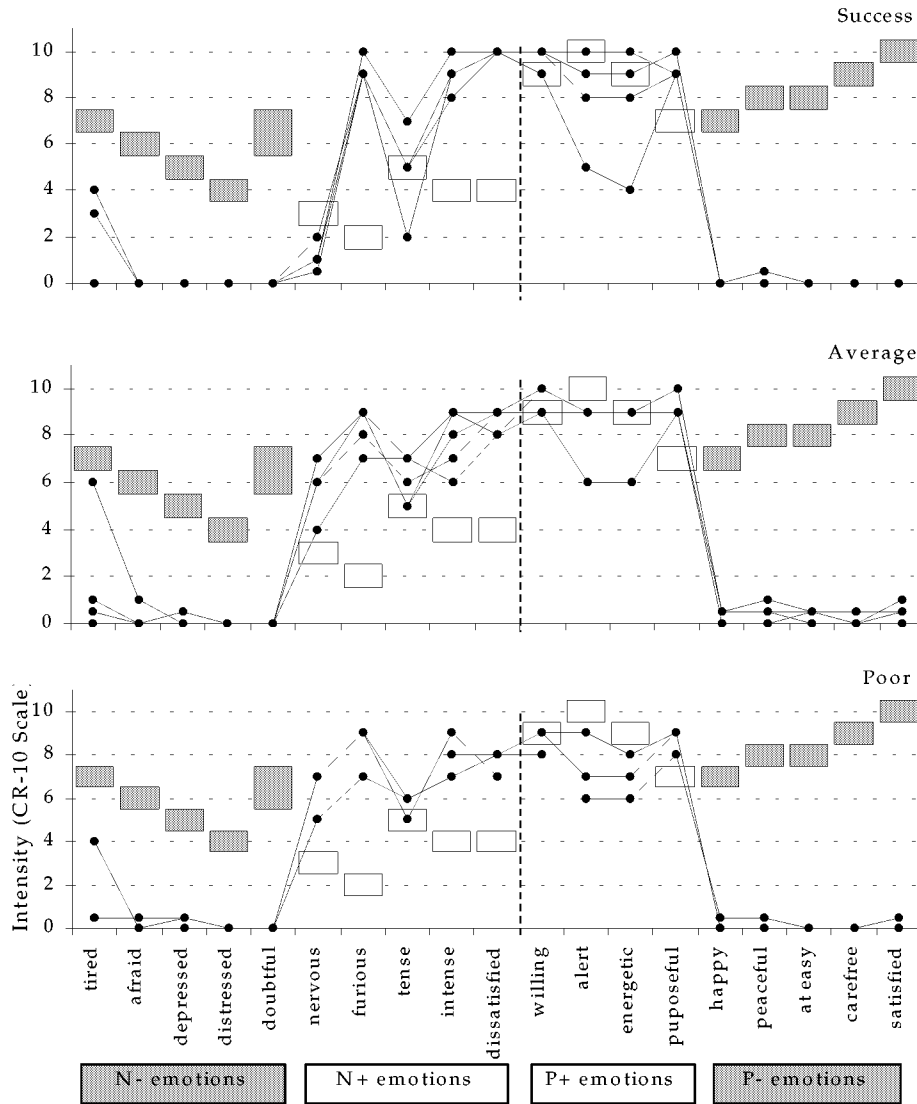
Appendix 12 (continues)

Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 9* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)



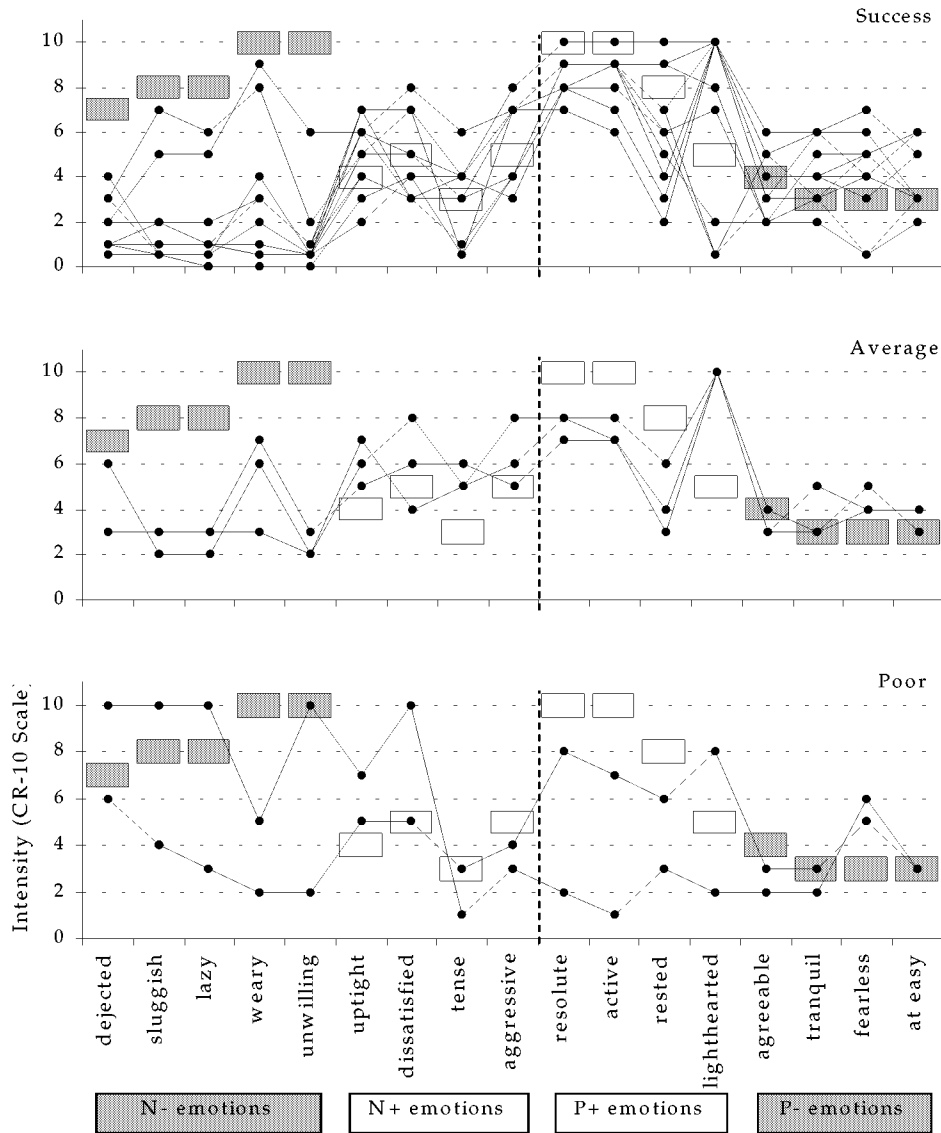
Appendix 12 (continues)

Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 12* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)



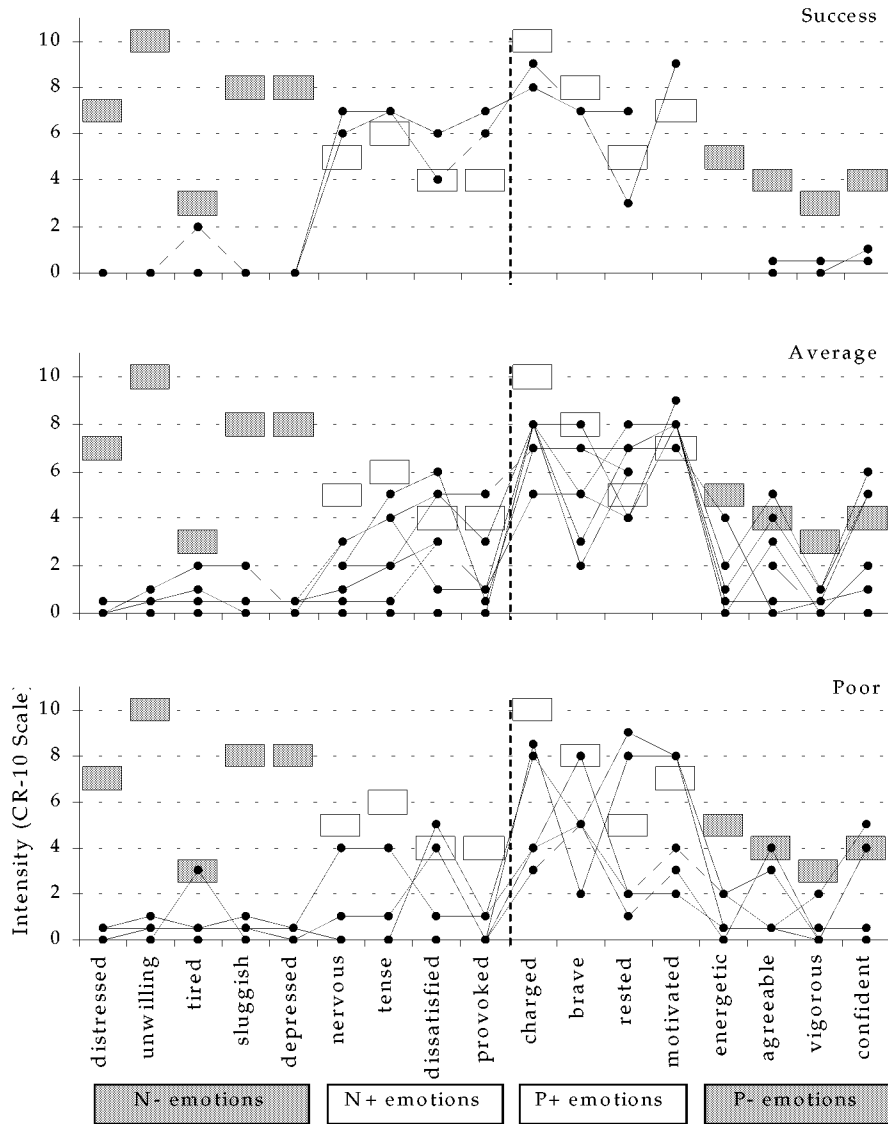
Appendix 12 (continues)

Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 16* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)



Appendix 12 (continues)

Emotion patterns in successful (7-10), average (4-6), and poor (0-3) performance for *player 17* (Blank area describes the optimal and grey area dysfunctional zones ( $\pm 0.5$ ); curves show the recalled during-game emotion intensities; self-rated partial performance levels were used)



The players' answers to the open-ended questions regarding *positive optimal emotions (P+)*

| Emotion description (P+)                   | Player | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ?                                 | Why and how the emotion is <i>useful</i> for you?   |
|--|--------|--|---|
| agreeable (mielilyttävä)<br>alert (pirteä) | P65    | Ei ole liian jännittyneyt.   | You are not too tense.  |
|  | P19    | Valmis ottamaan vastaan ja antamaan uusia asioita.                                   | I'm ready to take and give new things.  |
| brave (rohkea)                             | P51    | Jotta on kokoajan tilanteen tasalla ja vähän edelläkin.                              | In order to be on top of the situation or even a bit ahead.                               |
|  | P57    | Uskaltaa tehdä ratkaisuja enemmän ja erilaisia.                                      | I dare to make more decisions and different kinds of decisions.                           |
| brisk (rivakka)                            | P59    | "Ei se pelaa, joka pelkää."  | He doesn't play, who is afraid.   |
|  | P65    | Uskaltaa tehdä juttuja ja yrittää omia juttuja.                                      | I dare to try things and do my own things.  |
|  | P15    | Tuntee itsensä henkisesti ja fyysisesti vahvaksi.                                    | I feel strong in physically and mentally.   |
|  | P30    | Alkuperäisyydessä yritän tehdä asiat mahdollisimman nopeasti ja terävästi.           | In the warm-up I try to work as fast and briskly as I can.                                |
| carefree (huoleton)                        | P48    | Keskittyminen ei häirinyt muiden asioiden takia.                                     | Concentration does not interfere with other things.                                       |
|  | P58    | Huolettomuudella tarkoitan pelissä esiintyvää painetta. Jos ei painetta → hyvä peli. | By feeling carefree I mean the pressure in the game. If there is no pressure → good game. |
| certain (varma)                            | P59    | Tässä tapauksessa tarkoitan "siviilielämän" tasapainoa.                              | In this context I mean the balance in life away from the game.                            |
|  | P6     | Tietää olevansa kunnossa.  | I know I'm in good shape.   |
|  | P19    | Antaa tunteen, että hallitsee tarvittavat asiat.                                     | Gives me the feeling that I can handle what needs to be done.                             |
| charged (latautunut)                       | P44    | Tietää mitä osaa ja että pärjää ja mitä pitää tehdä.                                 | I know what I can do, what I'm capable of, and what I should do.                          |
|  | P57    | Luottaa, että tekee oikein.  | I trust that I'm doing the right thing.   |
| charged (latautunut)                       | P65    | Kaikkea mitä kentällä tekee niin tietää että osaa sen.                               | Everything that I do on the field, I know I can handle it.                                |
|  | P6     | Pystyn keskittymään ottelussa paremmin.  | My concentration on the game is better.   |

continues

| Emotion description (P+) | Player | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ?                            | Why and how is the emotion <i>useful</i> for you?   |
|--------------------------|--------|---|---|
| P32                      |        | Silloin valmistautuu peliin huolella ja tietää millainen vastus on edessä.      | My preparation is done carefully and I know my opponent.  |
| P49                      |        | Olen sopivasti latautunut, olen keskittynyt ja valmistautunut juuri tätä varten | I'm suitable charged, I'm focused and prepared for what will happen.                                  |
| P53                      |        | Jos pelissä on kovat panokset, se pistää yrittämään vaikka väkisin.             | If there is a lot to gain, it makes you do anything.  |
| P59                      |        | Hyvin latautuneena on keskittynyt ja tekee parhaan mahdollisen tuloksen.        | When you are well charged you are focused and you will perform to achieve the best possible result.   |
| cheerful (hyväntuulinen) | P32    | Kun tausta asioita ei tarvi kantaa huolta, peli kulkee varmasti.                | When background matters are all right, success is certain.  |
|                          | P51    | Pystyy nauramaan koko hommalle, ottaen kuitenkin tosissaan.                     | I can laugh about the whole business but still take it seriously.                                     |
|                          | P67    | Ei ota päähän jokin epäonnistuminen.  | I'm not annoyed by every unsuccessful performance.  |
| confident (luottavainen) | P8     | Tietää itse, että pärjää niin uskaltaa yrittää rohkeampia ratkaisuja.           | I know I'm performing well, so I'm not afraid to try out bolder solutions.                            |
|                          | P30    | Peliä edeltävät harjoitukset ovat sujuneet hyvin ja tunnen olevani kunnossa.    | The training before the game has gone well and I feel that I'm in good shape.                         |
|                          | P32    | Tietää mitä osaa ja uskaltaa käyttää niitä.                                     | I know what I can do and I dare to do it. Unsuccessful performances do not depress me.                |
|                          | P48    | Ei masennu epäonnistumisesta.   | I know exactly what I'm capable of.   |
|                          | P51    | Tiedän tarkalleen mihin pystyn.   | I know what I should do and I dare to do it.  |
|                          | P51    | Tietää mitä pitää tehdä ja uskaltaa myös tehdä sen.                             |   |
|                          | P57    | Uskaltaa tehdä ratkaisuja enemmän ja erilaisia.                                 | I dare to make more decisions and different kinds of decisions.                                       |
|                          | P58    | Jos luotan itseeni pystyn esittämään vapautuneesti pelissä asioita.             | If I trust myself I'm able to perform freely in the game.   |
|                          | P67    | Uskoo tekevänsä oikein ja sitä kautta uskaltaa yrittää erilaisia asioita.       | I believe that I'm doing the right thing and in that way I dare to try out different kinds of things. |

continues

| Emotion description (P+)    | Player | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ?   | Why and how is the emotion <i>useful</i> for you?   |
|-----------------------------|--------|--|---|
| daring (uskalias)           | P15    | Tietää omat parhaat puolensa ja uskaltaa käyttää niitä, ei pelkää epäonnistumisia.                                   | I know my strong points and I dare to use them. I'm not afraid of failure.  |
| determined (määrätietoinen) | P19    | Pystyy jopa ylittämään omia rajojaan.  | I'm able to go even beyond my limits.   |
|                             | P48    | Olo on varma ja tuntuu, että pallo pysyy.  | I feel secure and that the ball will stay with me.  |
| eager (innokas)             | P53    | On selvä päämäärä mihin pyrkii ja laittaa peliin sen vuoksi.   | There is a clear target to aim for and I want to give myself for it.  |
|                             | P44    | Todella haluaa mennä kentälle. Jalat ja pää toimii hyvin. Nauttii kentällä.  | I really want to go onto the pitch. My legs and mind are working well. I enjoy being on the pitch.  |
| energetic (energinen)       | P8     | Jaksaa pelata ja tietää jaksavansa.  | I have the strength to play and I know I'll be able to do it.   |
|                             | P15    | Tuntee jaksavansa tehdä töitä ja kannustaa muita.  | I feel that I have the strength to do the work and support others.  |
| energetic (energinen)       | P30    | Energinen olo tulee hyvästä keskittymisestä ennen peliä, eliikkä olen levännyt ja syönyt hyvin.                      | Feeling energetic comes from good concentration before the game, in other words I have rested and eaten well.   |
|                             | P32    | Jaksat keskittyä peliin koko ajan, liika energisyys on kuitenkin huono juttu.  | You can concentrate to the game all the time; however, it is bad to feel too energetic.   |
| energetic (energinen)       | P48    | Lihaksissa on voimaa.  | There is power in my muscles.   |
|                             | P49    | Tunnen, että minulla on energiaa ja tarmoa pelata alusta alkaen loppuun saakka.                                      | I feel that I have the energy to play from start to finish.   |
| energetic (energinen)       | P51    | Jotta on kokoajan tilanteen tasalla ja vähän edelläkin. Sekä jaksaa mennä kokoajan tietäen ettei tarvitse säästellä. | Enable you to be on the top of the situation all the time or even a bit ahead. And I can go all the time knowing that I don't have to hold anything back. |
|                             | P57    | Jaksaa tehdä töitä hyvän tuloksen eteen.   | I have the strength to work for a good result.  |
| energetic (energinen)       | P59    | Energinen olo ja fiilis tuo kroppaan tietyn varmuuden.   | Feeling energetic brings a certain security into your body.   |
|                             | P67    | Jaksaa touhuta kentällä. Pääsee peliin mukaan.   | I have the strength to play in the field. I will get into the game.   |
| enthusiastic (innostunut)   | P30    | Ennen peliä ajattelee hyviä suorituksia, sitä kautta tulee innostunut fiilis.  | Before the game I think of successful performances in the past, it makes me enthusiastic.   |
| enthusiastic (innostunut)   | P52    | Tekee mieli olla kokoajan mukana pelissä.  | I want to be in the game all the time.  |

| Emotion description (P+) | Player | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ?                                     | Why and how is the emotion <i>useful</i> for you?  |
|--------------------------|--------|--|--|
| ecstatic (hurmioitunut)  | P65    | On tunne, että tämä (jalkapallo) on loistavaa.   | I have a feeling that this (soccer) is great.  |
| fearless (peloton)       | P44    | Ei pelkää vastustajaa. Tietää että on tarpeeksi hyvä, eikä pelkää että epäonnistuu.      | I'm not afraid of my opponent. I know that I'm good enough, and I'm not afraid of failure. |
|                          | P51    | Uskaltaa mennä joka palloon vaikka voisi itsekin loukata.                                | I dare to go for every ball (situation) even if there is the chance of getting hurt.       |
|                          | P52    | Henkinen yliote vastustajasta tilanteisiin mennään.                                      | To beat my opponent mentally, I just go for it.  |
| glad (iloinen)           | P58    | Jos pelkään en uskalla yrittää omia ratkaisuja.  | If I'm afraid I don't dare to make my own decisions.                                       |
|                          | P32    | Kun tausta asioita ei tarvi kantaa huolta, peli kulkee varmasti.                         | When you don't have to worry about background matters, the game goes well.                 |
| motivated (motivoitunut) | P6     | Jos en olisi motivoitunut, minun olisi vaikea keskittyä hyvin.                           | If I weren't motivated, it would be hard to concentrate well.                              |
|                          | P8     | Tuntee tekevänsä hyvää ja tärkeää työtä (antaa fiilistä).                                | I feel that I'm doing good and important work (gives me the feeling).                      |
|                          | P53    | Motivaatio on korkealla, koska tietää että on tärkeä peli eikä voi löysäillä.            | Motivation is high, because I know the forthcoming game is important and I can't be slack. |
|                          | P59    | Ilman kunnon motivaatiota asenne saattaa löystyä.  | Without proper motivation the attitude may get slack.                                      |
| peaceful (rauhallinen)   | P67    | Muuten ei pysty keskittymään suoritukseen.   | Otherwise I can't concentrate to the performance.  |
|                          | P58    | Rauhallisuus on minulle A ja O. Se tuo varmuutta itselle.                                | Feeling peaceful is everything for me. It brings me security.                              |
| reactive (sähkö)         | P6     | Se tuo viimeisen silauksen ennen ottelun alkua.  | It's the finishing touch before the game starts.   |
|                          | P32    | Päätet peliin hyvin sisään kun saat hyvän tatsin palloon.                                | You get well into the game if you make good contact with the ball.                         |
|                          | P49    | Olo on sähkö ja terävä → ajattelen nopeasti ja pääsen liikkeelle terävästi / sähkökästi. | I feel reactive and sharp → I think fast and I can react quickly.                          |
| relaxed (rentoutunut)    | P44    | Että voi rauhassa keskittyä otteluun. Itseluottamus korkea.                              | Helps you to concentrate on the game in peace. My self-confidence is high.                 |

continues



| Emotion description (P+) | Player | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ?  | Why and how is the emotion <i>useful</i> for you?  |
|--------------------------|--------|---|--|
|                          | P67    | Syntyy hyvä tasapaino energisyyden kanssa, ei tule liikaa tohinaa.                                      | It comes into good balance with energeticness and ensures that there is not too much to do.                                |
| resolute (päätäväinen)   | P30    | Tiedän mitä teen kun menen kentälle.  | I know what I'm going to do when I go onto the pitch.  |
|                          | P49    | Luotan itseeni ja teen niitä asioita, joissa olen hyvä ja koko ajan täysillä.                           | I trust my self and I do the things I'm good at and all out all the time.  |
| rested (levännyt)        | P57    | Tietää mitä tekee ja tekee kunnolla.  | I know what I doing and I do it well.  |
|                          | P58    | Jos olen päättäväinen uskaltaa tehdä ratkaisuja.  | If I'm resolute I dare to make decisions.  |
|                          | P6     | Koska jaksaa pelata ottelun täysillä  | I have the strength to play the whole game all out.  |
|                          | P8     | Jaksaa tehdä töitä enemmän kentällä.  | I have the strength to do more work at the field.  |
|                          | P19    | Antaa pohjan kaikelle toiminnalle.  | Lays the foundation for everything else.   |
| satisfied (tyytyväinen)  | P53    | Kun tuntee, että on levännyt on varma, että jaksaa painaa täysillä.                                     | When you feel rested, you know that you can give it everything you're got.   |
|                          | P44    | Että on hyvällä tuulella kun lähtee kentälle, niin pitää kentällä hauskaa - keskittyy enemmän otteluun. | Helps you to be in a good mood when you go onto the pitch, to enjoy being on the field - you concentrate on the game more. |
| willing (halukas)        | P19    | Jos on halukas tekemään jotain, onnistumiselle paremmat edellytykset.                                   | If I'm willing to do something, the probability of success is better.  |
|                          | P52    | Halu olla paras, sekä voittaa.  | I want to be the best and to win.  |
|                          | P53    | On halua pelata ja taistella.   | I have the will to play and fight.   |
|                          | P65    | Haluaa osallistua peliin.   | I want to take part in the game.   |

The players' answers to the open-ended questions regarding *negative optimal emotions* (N+)

| Emotion description (N+)  | Player | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ?  | Why and how is the emotion <i>useful</i> for you?   |
|---------------------------|--------|---|---|
| aggressive (hyökkäävä)    | P6     | Aggressiivisuus otteisiin ennen ottelua.  | I get aggressiveness into my game before the match starts.  |
|                           | P59    | Aggressiivisuus kasvaa → itseluottamus (osittain).  | It increases aggressiveness → self-confidence (partly).   |
| angry (vihainen)          | P65    | Uskaltaa olla ja on aggressiivinen.   | I'm not afraid to be and am aggressive.   |
|                           | P44    | Voi olla hyvä. Enemmän näytön halua. Täytyy olla hullittu kuitenkin.                        | Can be good. Gives you stronger desire to show what you can do. However, it has to be restrained.           |
| dispirited (apea)         | P51    | Menee kaksinkamppailuihin ottaakseen pallon ja saadakseen henkisen yllötteen vastustajasta. | I will go into one-to-one situations with the purpose of taking the ball and beating the opponent mentally. |
|                           | P58    | Apeus voi vaikuttaa positiivisesti. Jos se vie liian jännityksen pois.                      | Feeling dispirited may have a positive influence, if it takes away extra tension.                           |
| dissatisfied (tyytymätön) | P6     | Yrittää parantaa aina joissakin asioissa (pelissä)  | I'm always trying to improve in some areas (in the game).   |
|                           | P30    | Ettei olo olisi liian varma täytyy miettiä mitä asioita täytyy tehdä paremmin.              | To avoid feeling over-secure, I have to think about what I could do better.                                 |
| furious (raivostunut)     | P51    | Antaessaan huonon syötön yms. vaatii itseltään enemmän seuraavassa.                         | If I give a bad pass, I will demand more myself next time.  |
|                           | P52    | Ei ole tyytyväinen ennen kuin kaikki toimii.  | I'm not satisfied before everything works.  |
| intense (kiivas)          | P53    | Ei ole tyytyväinen omaan eikä kaverin suoritukseen ja vaatii itseltään lisää.               | I'm not satisfied with my own or teammates' performance and I demand more of myself.                        |
|                           | P57    | Halu tehdä paremmin tuo tulosta.  | The will to do better will bring results.   |
| intense (kiivas)          | P58    | Tyytymättömyys pistää jalkani liikkeelle.   | Dissatisfaction gets my legs going.   |
|                           | P65    | Ettei ole koskaan täysin tyytyväinen, vaan aina jää jotain mitä voisi tehdä paremmin.       | So as not to be completely satisfied, and there is always something that could be done in a better way.     |
| intense (kiivas)          | P67    | Ei tyydy aikaisempiin suorituksiin vaan yrittää aina vaan parempan.                         | I'm not satisfied with my performances in the past, and so I try to play better.                            |
|                           | P57    | Puolustettaessa hyödyllinen tunne (sopivasti)   | In defensive play this is a useful emotions (the right amount).   |
| intense (kiivas)          | P15    | Silloin on hyvin pelissä mukana, kokoajan valmiina.   | Then, I'm well into the game and ready all the time.  |

continues

| Emotion description (N+) Player | Miksi ja miten tunne on sinulle <i>hujödyllinen?</i>  | Why and how is the emotion <i>useful</i> for you?   |
|---------------------------------|---|---|
| P51                             | Menee kaksinkamppailuihin ottaakseen pallon ja saadakseen henkisen ylivoitteen vastustajasta.                           | I will go into one-to-one situations with the purpose of taking the ball and beating my opponent mentally.                                |
| P59                             | Antaa ottelulle taistelun maun.   | It gives me a fighting spirit for the game.   |
| P19                             | Antaa sysäyksen ja oikein kanavoituna antaa mahdollisuuden keskittyä olennaiseen.                                       | Gives me power and properly channelled allows me to concentrate on what is relevant.  |
| P32                             | Liika hyväntuulisuus on pahasta, silloin on liian lepsu olo.  | Being in too much of a good mood is bad, meaning that your attitude is too slack.   |
| P15                             | Se antaa pienen epävarmuuden tunteen, jolloin ei voi tehdä ylimielisiä ratkaisuja.                                      | It makes me feel a little bit uncertain, meaning that it stops me from making arrogant decisions.   |
| P4                              | Pieni jännitys että pysyy valppaana ja keskittyneenä. Antaa vähän ekstra voimaa ja energiaa.                            | Feeling a little bit tense keeps me alert and focused. Gives me a bit of extra power and energy.  |
| P57                             | Pieni hermostuneisuus pitää vireyttä yllä.  | Feeling a little bit nervous keeps me aroused.  |
| P67                             | Jos en ole yhtään hermostunut hommasta ei tule yhtään mitään.   | If I'm not at all nervous about something, it won't come to anything.   |
| P19                             | Antaa lisää potkua.   | It gives me more power.   |
| P48                             | Jännitys ja energisuus tuntuvat sisäisesti hyvältä.   | Feeling tense and energetic make me feel good.  |
| P52                             | Jakaa pelata enemmän, ei ajattele väsymystä.  | I can play longer, I don't think about being tired.   |
| P53                             | On koko ajan pelissä, eikä herpaannu hetkeksikään.  | I'm in the game all the time, I don't lose my interest at all.  |
| P59                             | Pääsee tunnelmaan → "kiihkeä paikalliskamppailu"  | You get into atmosphere → a passionate local game.  |
| P49                             | Pienet ärsykkeet tekevät hyvää (edellisestä kohtaamisesta on esim. jäänyt jotain hampaankoloon ja nyt on halu näyttää). | Small setbacks are good for you (e.g. in the last game everything did not go as planned and now you have chance to show what you can do). |
| P59                             | Aggressiivisuus kasvaa → itsetuottamus (osittain).  | It increases aggressiveness → self-confidence (partly).   |
| P6                              | (On tulossa matsi) Se vain kuuluu ennen alkuverryttelyn alkua.  | (The game is at hand) It's a natural part of it before the warm-up starts.  |
| P8                              | Se antaa lisää voimavaroja.   | It gives me more power.   |

Appendix 14 (continues)

| Emotion description (N+) | Player  | Miksi ja miten tunne on sinulle <i>hyödyllinen</i> ? | Why and how is the emotion <i>useful</i> for you?                                      |
|--------------------------|---|--|--|
| P15                      | Se pakottaa keskittymään jokaiseen tilanteeseen, on aina valmiina.                        |  | It makes me concentrate on every situation, I'm always ready.                          |
| P30                      | Pienestä jännityksestä tietää, että tulossa on jotain tärkeää.                            |  | If you feel a little tense, you know that there is something important coming.         |
| P44                      | Pieni jännitys että pysyy valppaana ja keskittyneenä.                                     |  | Feeling a little bit tense keeps me alert and focused.                                 |
| P48                      | Ajatukset pysyvät pelissä kokoajan. Tuntuu, että olen paljon huoleellisempi, kun jännitän |  | My thoughts are on the game all the time. I feel that I'm more careful when I'm tense. |
| P49                      | Jonkin verran täytyy olla jännitystä → silloin on ainakin hyvin latautunut.               |  | There has to be some tension → at least you are well charged then.                     |
| P57                      | Jos on jännittynyt on myös keskittynyt.   |  | If you are tense you are focused.  |
| P65                      | Että on latautunut hyvin peliin.  |  | So you are well charged for the game.  |
| P67                      | Etten mene peliin liian rentona ja huottavaisena. Tuo virinää.                            |  | So I don't go into the game feeling too relaxed and confident.                         |
| P8                       | Pysyy koko ajan mukana. Ei nukahtelee pelissä.  |  | I keep up all the time. I don't fall asleep during the game.                           |
| P30                      | En voi olla täysin unessa kun olen rauhaton.  |  | I can't fall asleep if I feel unsettled.   |
|                          | unsettled (rauhaton)  |  |  |

The players' answers to the open-ended questions regarding *positive dysfunctional emotions (P-)*

| Emotion description (P-) | Player | Miksi ja miten tunne on sinulle <i>haitallinen</i> ?   | Why and how is the emotion <i>harmful</i> for you?  |
|--------------------------|--------|--|---|
| agreeable (miellyttävä)  | P6     | Se vie aggressiivisuutta.  | Takes away the aggressiveness.  |
|                          | P57    | Hyvän olon tunne, laiskuus.  | Pleasant feelings, laziness.  |
|                          | P59    | Liian miellyttävä tunne saattaa vaikeuttaa esim. seuraavaan tilanteeseen asennoitumista (esim. johtotilanteessa).          | If you feel too good it may make it difficult for instance to get ready for the next situation (e.g. when you are in the lead). |
| animated (vilkas)        | P19    | Ajatukset pyörivät epäolennaisissa   | I think irrelevant thoughts.  |
|                          | P32    | Hosut ennen peliä kaikkennäköistä, millä ei ole mitään tekemistä pelin kanssa.   | You do all kinds of things before the game which have nothing to do with the game.  |
|                          | P44    | Ajattelee paljon muita asioita, on todella energinen mutta tekee paljon turhaa työtä.                                      | I think a lot about other things, I'm very energetic but I do a lot of unnecessary work.  |
|                          | P57    | Liika vilkkaus vie keskittymistä.  | Feeling too lively takes away from your concentration.  |
|                          | P15    | Silloin ei keskity peliin kunnolla, aggressiivisuus puuttuu.   | Then I don't concentrate on the game properly, I lack aggressiveness.   |
| at easy (mukava)         | P49    | Liian mukava olo tekee helposti flegmaattiseksi, ei saa itsestään irti kaikkea   | Feeling too at easy make you easily easy-going (phlegmatic), you can't get the most out of yourself.                            |
|                          | P57    | Hyvän olon tunne, laiskuus.  | Pleasant feelings, laziness.  |
|                          | P59    | Mukava tunne / olotila tuo kroppaan hämmennyneisyyttä  | An agreeable feeling in the body will make you confused.  |
| calm (levollinen)        | P30    | En ole keskittynyt peliin ja olo on liian löysä.   | I haven't been concentrating on the game, feeling too slack.  |
|                          | P67    | Jos en ole yhtään hermostunut / jännittynyt, syntyy liian löysä asenne peliin.   | If I'm not nervous / tense at all, my attitude to the game is too slack.  |
| carefree (huoleton)      | P6     | Jos ei olisi mitään huolen aiheita, olisi vaikea pelata hyvin.   | If there is nothing to worry about, it would be difficult to play well.   |
|                          | P32    | Et kannu huolta vastustajasta. Aliarvioit sen etkä ole miettinyt esim. vastustajan vahvuuksia ja vastaan tulevia pelaajia. | You don't worry enough about your opponent. You underestimate e.g. the strengths of your opponent and the other side.           |

continues

| Emotion description (P-)  | Player | Miksi ja miten tunne on sinulle <i>haitallinen</i> ?  | Why and how is the emotion <i>harmful</i> for you?  |
|---------------------------|--------|---|---|
|                           | P44    | Ei keskity tarpeeksi. Vähän "hällä väliä" fiilis.   | I don't concentrate enough. A touch of the "who cares" feeling.   |
|                           | P53    | Tulee löysä olo ja ei ole halua yrittää eikä taistella.   | I feel slack, and I don't want to make an effort and fight.   |
|                           | P57    | Huoleton on myös huolimaton.  | If you are carefree, you are also careless.   |
|                           | P65    | Ei ota peliä tosissaan.   | You don't take the game seriously.  |
|                           | P67    | Syntyy liian helposti jos on "merkityksetön" peli. Peli menee kävelyksi.  | It becomes too easy if the game has no significance. My play is without effort.   |
| certain (varma)           | P49    | Liian itsevarma olo haitaksi. (Sopivan varma olo sopisi myös P+ tunteeksi)  | Feeling too much self-confidence is bad (at the suitable level could also suit for the P+ feeling).                           |
| cheerful (hyväntuulinen)  | P52    | Ei ajattele pelaamista 100%, terävyys puuttuu.  | I don't think 100 % about my performance, a lack of edge.   |
| confident (luottavainen)  | P52    | Luottaa liikaa itseensä.  | I'm too confident in myself.  |
| ecstatic (hurrmioitunut)  | P15    | Silloin ei keskity peliin kunnolla, aggressiivisuus puuttuu.  | Then I don't concentrate on the game properly, I lack aggressiveness.   |
|                           | P30    | Jos olen hurrmioitunut ja tyytyväinen niin kaikki asiat näyttävät olevan liian hyvin eikä se ole hyvä asia ennen peliä. | If I'm overjoyed and satisfied, everything seems to be too good and that is not a good thing before a game.                   |
|                           | P51    | Paljon yleisöä tai muutten hyvä pelifiilis voi mennä yli ja peli ohii ihmettelemiseksi.                                 | Because of a lot of spectators or for other reasons the good feelings about playing may go over the top and the game is over. |
| energetic (energinen)     | P58    | Liikaa energiaa. Se vie pelistä rauhallisuuden ja varmuuden pois.   | Feeling too energetic takes the calmness and certainty away from my game.   |
| fearless (peloton)        | P15    | Ottaa liikaa tyhmiä riskejä.  | I take too many stupid risks.   |
| glad (iloinen)            | P6     | En saa olla liian iloinen.  | I can't be too glad.  |
|                           | P65    | Ei saa itsestään irti oikeaa kovuutta.  | I can't summon up the necessary toughness.  |
| good (hyvä)               | P65    | Saa olon flegmaattiseksi.   | Makes me feel easy-going.   |
| happy (onnellinen)        | P6     | Tulee otteluissa hyvän olon tunne.  | A good feeling comes during the play.   |
| lively (eloisa)           | P52    | Väsäilee kaikkea muuta mitä pitäisi.  | I'm doing everything else but what I should be doing.   |
| overjoyed (iki-ihastunut) | P8     | Ei pysty keskittymään pelaamiseen jos on muut mielessä.   | I can't concentrate on the game if other things are on my mind.   |

continues

| Emotion description (P-) | Player | Miksi ja miten tunne on sinulle <i>haitallinen</i> ?   | Why and how is the emotion <i>harmful</i> for you?  |
|--------------------------|--------|--|---|
| peaceful (rauhallinen)   | P59    | Keskittyy muuhun kuin futikseen.   | I concentrate on other things than soccer.  |
|                          | P8     | Ei pysy ajan hermolla. Ei löydä tarpeeksi räväkkyyttä.   | I can't stay on the top of the moment. I can't find enough "speed".   |
| relaxed (rentoutunut)    | P48    | Lihakset ovat vetelät, ajatus "helppo matsi", tunne liian flegmaattinen.   | The muscles are flabby, the thought of an "easy game", feeling too easy-going.  |
| satisfied (tyytyväinen)  | P30    | Jos olen hurmioitunut ja tyytyväinen niin kaikki asiat näyttävät olevan liian hyvin eikä se ole hyvä asia ennen peliä. | If I'm ecstatic and satisfied, all things seems to be too good and that is not good thing before a game.              |
|                          | P32    | Esim. edellinen peli mennyt hyvin ja luulet itseltäsi liikoja.   | For example, the last game went well and you think too much of yourself.  |
|                          | P51    | Esim. pallonriiston jälkeen voi seuraava syöttö mennä harakoille, koska tyytyi palloriistoon.                          | For instance, after stealing the ball the next situation might go against you because you were feeling too satisfied. |
|                          | P57    | Hyvän olon tunne, laiskuus.  | Pleasant feeling, laziness.   |
|                          | P67    | Ei ole pelissä mitään saavutettavaa.   | There is nothing to get out of the game.  |
|                          | P19    | E i ole valmis lajin vaatimaan suoritukseen.   | I'm not ready to do what soccer demands.  |
| tranquil (tyyni)         | P30    | En ole keskittynyt peliin ja olo on liian löysä.   | I haven't focused on the game, and feeling is too slack.  |

The players' answers to the open-ended questions regarding *negative dysfunctional emotions* (N-)

| Emotion description (N-)  | Player | Miksi ja miten tunne on sinulle <i>haitallinen</i> ?   | Why and how is the emotion <i>harmful</i> for you?   |
|---------------------------|--------|--|--|
| afraid (pelokas)          | P6     | Ei uskalla mennä tilanteisiin.   | I don't dare to go into situations.  |
| alarmed (häättyntynyt)    | P53    | Hätäilee koko ajan ja tulee paniikki ratkaisuja.   | I hurry all the time and make panic decisions.   |
| annoyed (suuttunut)       | P32    | Kun olet suuttunut, keskityn kaikkien epäolennaiseen (esim. tuomarin arvosteluun).                     | When you are annoyed, you concentrate on all kinds of irrelevant things (such as blaming the referee). |
| concerned (huolestunut)   | P52    | Murehtii muita asioita.  | I worry about other things.  |
|                           | P67    | En uskalla tehdä mitään erikoista, tulee tasapaksu peli.   | I'm afraid to do anything out of the ordinary, which means I play a routine game.                      |
| dejected (allapäin)       | P8     | Mikään ei silloin kiinnosta. Ei jaksa osallistua peliin.   | Nothing interests me. I can't take part in the game.   |
|                           | P19    | Vireystila kärsii.   | Arousal suffers.   |
|                           | P67    | Jos tulee yksi epäonnistuminen tuntuu, että peli on menetetty.   | A single failure makes me feel that the game is over.  |
| depressed (masentunut)    | P6     | Se vaikuttaa itseluottamukseen.  | It has an influence on my self-confidence.   |
|                           | P32    | Jos siviilissä ei kaikki ole kunnossa (esim. koulussa).  | If there is something wrong in my life outside the game (e.g. in school).                              |
|                           | P65    | Muut asiat pyörivät mielessä liikaa.   | Other things are too much on my mind.  |
| dissatisfied (tyytymätön) | P44    | Paljon muita asioita painaa mielessä. Huonolla tuulella. Kentällä syytän muita ja peli menee huonosti. | I think a lot about other things. I'm in a bad mood. On the field I blame others and I play badly.     |
| distressed (ahdistunut)   | P30    | Tulee tielle epäonnistumisia ja ikäviä asioita.  | I come up against failure and bad things.  |
|                           | P48    | Ajatukset karkailevat jos jokin asia painaa.   | My thoughts run a way, if something is bothering me.   |
| doubtful (epätietoinen)   | P51    | Epävarma, pallo polttaa jaloissa, ratkaisut ovat hätäisiä ja huonoja                                   | Feeling uncertain, I can't control the ball, decisions are made in a hurry and they are bad.           |
|                           | P52    | Ei aavistustakaan mitä pitäisi tehdä.  | I don't have a clue what to do.  |
|                           | P59    | Tuo hermostuneen olon mikä taas aiheuttaa paljon hätköityjä ratkaisuja                                 | It makes me feel nervous, which in turn means I make hasty decisions.                                  |
| exhausted (uupunut)       | P65    | Ei jaksa antaa kaikkea.  | I don't have the strength to give it all I've got.   |

continues



| Emotion description (N-) | Player | Miksi ja miten tunne on sinulle <i>haitallinen</i> ?   | Why and how is the emotion <i>harmful</i> for you?  |
|--------------------------|--------|--|---|
| frightened (säikähtynyt) | P59    | Pelkotila  | A state of fear.  |
| lazy (laiska)            | P44    | Ei jaksaisi oikein pelata. Ajattelee etä kyllä se menee rutiinilla → kentällä huonolla tuulella. Huono verryttely.   | I can play. I think it will go as a matter of routine → I feel moody on the field.<br>Lousy warm-up.  |
|                          | P48    | Ei huvita pelihommat (nyt just) yhtään. Tekisi mieli olla jossain muualla kuin kentällä.   | I just don't want to play. I would like to be somewhere else than on the field.   |
|                          | P65    | Ei jaksa osallistua peliin täysillä.   | I don't have the strength to take part in the game at full stretch.   |
|                          | P67    | Jos on laiska olo, peli ei kiinnostanut tarpeeksi, ei pysty tekemään tarpeeksi työtä.  | If you feel lazy, the game does not interest you. You are not able to put in enough work.   |
| nervous (hermostunut)    | P58    | Jos hermostunut → varmuus ja yritykset ovat pois pelistä.  | If you feel nervous → a sense of certainty and the ability to make an effort disappears from my game.   |
|                          | P59    | Hermostuneena tekee paljon hätäkohtia ratkaisuja   | When you are nervous, you make do a lot of hasty decisions.   |
| provoked (ärsyyntynyt)   | P57    | Keskittymisky heikkenee.   | The ability to concentrate decreases.   |
| restless (levoton)       | P49    | Jos esim. kopissa on liikaa häiritseviä tekijöitä tulee äkkiä liian levoton olo, joka on haitaksi.   | If for instance in the locker room there are too many disturbing factors, it soon makes you restless, which is harmful.   |
| sad (surullinen)         | P8     | Jo on suruja ei pysty ajattelemaan muuta.  | If I'm unhappy, I'm not able to think anything else.  |
|                          | P65    | Muut asiat mielessä kuin peli.   | Other things are on my mind than the game.  |
| sluggish (veltto)        | P49    | Velto olo tekee sen, että ei jaksa olla kentällä täysillä mukana.  | Feeling sluggish prevents you having the strength to play all out.  |
| sorrowful (murheellinen) | P30    | Jos asiat kaatuu päälle.   | Everything goes wrong.  |
| tense (jännittynyt)      | P58    | Jännitys pahin ongelma. Se vie terävyyden sekä ajattelun pois pelistä. Mitä enemmän jännitän, sitä vaikeampi pelin alku on. Lihakset ovat löysät ja ensimmäiset kosketukset yleensä huonoja. | Feeling tense is the worst problem. It will take the edge and also thought away from the game. The tenses I am the more difficult will be the start of the game. My muscles are flabby and my first contacts with the ball are usually bad. |
| tired (väsynyt)          | P6     | Ei pysty keskittymään.   | I can't concentrate.  |

| Emotion description (N-) | Player | Miksi ja miten tunne on sinulle <i>haitalliment?</i>   | Why and how is the emotion <i>harmful</i> for you?   |
|--------------------------|--------|--|--|
|                          | P8     | Ei pysy pelissä, eikä jaksa tehdä töitä.   | I can't stay on the top of the game and I can't make the effort.   |
|                          | P15    | Ei jaksa tehdä asioita kunnolla.   | I don't have the strength to do the things properly.   |
|                          | P19    | Vie pohjaa osaltaan suoritusesta.  | Takes away the ground from under the performance.  |
|                          | P30    | Yleensä henkinen väsymys tulee useiden epäonnistumisten jälkeen.   | Usually mental tiredness comes after several failures.   |
|                          | P32    | Jos tunnen oloni väsyneeksi ennen peliä niin silloin tietää ettei huippupeliä voi tulla.                 | If I feel tired before the game I know it won't be possible to play a top-class game.  |
|                          | P48    | Väsyneenä en jännitä.  | When I'm tired I don't feel tension.   |
|                          | P49    | (Sama kuin velitto) Veltto olo tekee sen, että ei jaksa olla kentällä täysillä mukana.                   | (The same as sluggish) If you are sluggish, it prevents you playing all out.   |
|                          | P51    | Jäljessä kaikesta, ajatukset muualla.  | I'm behind everything, my mind is elsewhere.   |
|                          | P53    | Tulee kehoon väsynyt olo, eikä jaksa juosta.   | My body feels tired, I don't have the strength to run.   |
|                          | P57    | Ei jaksa tehdä asioita huolella.   | I don't have the strength to do the things with care.  |
|                          | P59    | Vastakohta energiselle. (Energinen olo ja fiilis tuo kroppaan tietyn varmuuden)                          | The opposite of energetic. (Feeling energetic tills you body with a certain sense of security)   |
| uncertain (epävarma)     | P6     | Ei luota itseensä, että peli menisi hyvin.   | I have no faith in myself that the game will be a success.   |
|                          | P8     | Ei uskalla tehdä ratkaisuja.   | I don't dare to make decisions.  |
|                          | P19    | Ei anna mahdollisuutta tehdä täysipainoista suoritusta.  | Does not allow me to perform at full stretch.  |
|                          | P32    | Epäonnistumisten kautta tullut luottamuksen puute omiin taitoihinsa.                                     | Failures cause a lack of confidence in your own abilities.   |
|                          | P44    | Ei luota itseensä tarpeeksi. Kentällä ei halua palloa, ei ota vastuuta. Ajattelee ennen ottelua häviötä. | I don't have enough faith in myself. I don't want the ball, I can't accept responsibility. I think that the game is lost even before it has started. |
|                          | P48    | Itseluottamus MV:lle erittäin tärkeä.  | For a goalkeeper self-confidence is very important.  |
|                          | P53    | Ei ole varma itsestään ja sitten tulee helppoja virheitä.  | I'm not sure of myself and thus I make easy mistakes.  |

continues

| Emotion description (N-) | Player | Miksi ja miten tunne on sinulle <i>haitallinen</i> ?                      | Why and how is the emotion <i>harmful</i> for you?                                |
|--------------------------|--------|---|---|
|                          | P57    | Puuttuu uskallusta, luovuus kärsii.                                       | There is a lack of daring, creativity suffers.                                    |
|                          | P67    | En uskalla tehdä mitään erikoista, tulee tasapaksu peli.                  | I'm afraid to do something special, which causes me to play a routine game.       |
| unhappy (onneton)        | P15    | Ajatukset pyörivät liikaa muissa asioissa.                                | My mind wanders too much.   |
| unsettled (rauhaton)     | P51    | Johtuu epätietoisuudesta tai jos on jotain ylimääräistä panosta.          | Stems from doubt or if extra demands are made.                                    |
|                          | P53    | Ei luota itseensä yhtään ja homma menee poskelleen.                       | I have no faith in myself and my game will go to the wall.                        |
|                          | P58    | Mitä rauhattomampi olo sitä huonompi peli.                                | The more restless you are the worse is the game.                                  |
| unwilling (haluton)      | P6     | Ei halua tehdä määrättyjä asioita.  | There is no desire to carry out orders.   |
|                          | P19    | Jos ei haluta niin sitten ei tosiaan haluta.                              | If I'm not willing then I'm really not willing.                                   |
|                          | P30    | Johtuu henkisestä väsymyksestä ja epäonnistumisista.                      | Due to mental tiredness and failure.  |
|                          | P52    | Ei tee mieli pelata.  | I don't feel like playing.  |
|                          | P59    | Jättää vastuun muille.  | I leave the responsibility to others.   |
| uptight (kireä)          | P15    | Silloin ottaa asiat liian helposti itseensä, ei kestä kritiikkiä.         | I take the things too easily to heart, I can't handle criticism.                  |
|                          | P58    | Leppoisa tunnelma on paljon parempi minulle kuin kireä, vaativa tunnelma. | For me a relaxed atmosphere is much better than an uptight, demanding atmosphere. |
| weary (näantynyt)        | P52    | Ei jaksa keskittyä olennaiseen.   | I can't concentrate on relevant issues.   |

## Appendix 17

Emotion descriptions used in the present study in English and in Finnish

| Positive emotions | Positiiviset tunteet         | Negative emotions | Negatiiviset tunteet    |
|-------------------|------------------------------|-------------------|-------------------------|
| active            | vireä                        | afraid            | pelokas                 |
| agreeable         | miellyttävä                  | aggressive        | hyökkäävä               |
| alert             | pirteä                       | alarmed           | häätäntynyt             |
| animated          | vilkas                       | angry             | vihainen                |
| at easy           | mukava                       | annoyed           | suuttunut               |
| brave             | rohkea                       | concerned         | huolestunut             |
| brisk             | rivakka                      | dejected          | allapäin                |
| calm              | levollinen                   | depressed         | masentunut              |
| carefree          | huoleton                     | dispirited        | apea                    |
| certain           | varma                        | dissatisfied      | tyytymätön              |
| charged           | latautunut                   | distressed        | ahdistunut              |
| cheerful          | hyväntuulinen                | doubtful          | epätietoinen            |
| confident         | luottavainen                 | exhausted         | uupunut                 |
| daring            | uskalias                     | explosive         | räjähdyt <sup>1)</sup>  |
| determined        | määrätietoinen               | frightened        | säikähtynyt             |
| eager             | innokas                      | furious           | raivostunut             |
| easy-going        | rento <sup>1)</sup>          | indignant         | närkästynyt             |
| ecstatic          | hurmioitunut                 | intense           | kiivas                  |
| energetic         | energinen                    | irresolute        | neuvoton                |
| enthusiastic      | innostunut                   | irritated         | ärtynyt                 |
| fearless          | peloton                      | lazy              | laiska                  |
| feeling too good  | liian hyvä olo <sup>1)</sup> | nervous           | hermostunut             |
| focused           | keskittynyt <sup>1)</sup>    | passionate        | kiihkeä                 |
| free              | vapaa                        | provoked          | ärsyntynyt              |
| glad              | iloinen                      | restless          | levoton                 |
| good              | hyvä                         | sad               | surullinen              |
| happy             | onnellinen                   | sluggish          | veltto                  |
| light-hearted     | suruton                      | sorrowful         | murheellinen            |
| lively            | eloisa                       | strained          | pingottunut             |
| motivated         | motivoitunut                 | tense             | jännittynyt             |
| nice              | kiva                         | terrified         | kauhistunut             |
| over-energetic    | ylienerginen <sup>1)</sup>   | tired             | väsynyt                 |
| overjoyed         | iki-ihastunut                | uncertain         | epävarma                |
| peaceful          | rauhallinen                  | unhappy           | onneton                 |
| reactive          | sähkökä                      | unsettled         | rauhaton                |
| reckless          | uhkarohkea                   | unwilling         | haluton                 |
| relaxed           | rentoutunut                  | uptight           | kireä                   |
| resolute          | päätäväinen                  | weary             | nääntynyt               |
| rested            | levännyt                     | worked up         | kiihtynyt <sup>1)</sup> |
| satisfied         | tyytyväinen                  |                   |                         |
| sharp             | terävä <sup>1)</sup>         |                   |                         |
| stimulated        | virittynyt                   |                   |                         |
| tranquil          | tyyni                        |                   |                         |
| vigorous          | tarmokas                     |                   |                         |
| willing           | halukas                      |                   |                         |

<sup>1)</sup> players own adjectives



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