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## Nonverbal behaviour (NVB) in the Premier League

An observational study on football players' tactical and emotional gestures during a football match

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## Preface

When I played football actively, I communicated constantly. I was constantly telling my teammates where to position themselves, who to mark and where to play the ball. I first learned to communicate so intensely when I first started playing senior football at 16 years old. It was quite intimidating to train and play with the senior players. The team had high standards and if a big mistake was made, especially if it was because of lack of communication, you would receive a yelling from some of the more experienced players. This made me very aware of how important communication was in a football team. I would start to constantly communicate with my teammates to both get more control and to compensate for my weaker attributes. I carried that with me in every team I played for. So when Geir Jordet introduced nonverbal behaviour in one of his lectures, I first thought: “Well is this not very common among players? I thought this was something every football player does”. However, as I became a coach, I found out that football players actively communicating to each other is not nearly as common as I first thought, especially for younger players. As a coach, I am constantly trying to get my players to communicate more to each other and try to give them solutions to how they can communicate more effectively. As the time went by, I became more and more captivated by how football players could and should communicate to each other. That is one of the reasons why nonverbal behaviour compelled me as much as it did. When Geir said that nonverbal behaviour would be his new passion project, it did not take long before I agreed to write about it in my master’s thesis.

However, finishing this thesis has without a doubt been a very long and challenging 1,5 years of hard work and dedication. There have been a great deal of challenges and setbacks with the code window, getting the analysis done, SPSS etc. Consequently, priorities and some sacrifices had to be made for this to be possible. Finally, after countless hours of doing the analysis as well as countless hours of writing, the thesis is finished and I can somewhat rest and put my student years behind me.

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## Abstract

The main aim of this study was to provide an overview of how football players in the Premier League use their nonverbal behaviour (NVB) to communicate with their teammates, the referee and others during a match. A goal was therefore to categorise the players' NVB and hopefully understand its connection to the players' psychological and emotional state. A non-participatory observational study was conducted by using the basic emotion theory (Ekman & Friesen, 1969), behavioural ecology theory (Fridlund, 1994), self-presentation (DePaulo, 1992) and the work of Furley (2021b) as the theoretical framework for this thesis. 271 players ( $M=26.4$  years,  $SD = 3.88$ ) who played for all of the 20 teams in the English Premier League were examined in matches played in the 2021/2022 season by using the analysis program Sportscode from Hudl.

Results show that players have a higher NVB frequency when they play in a central position than a wide position. Results also show that players have generally a higher NVB frequency when they are ahead and a lower frequency when they are behind. Examining the tactical and emotional NVB, the results illustrate that players become substantially more negative when they are behind, than when they are level or ahead. When a team goes behind the players generally direct their teammates more, try to influence the referee more and ask for the ball less. The findings also showed that home teams become substantially more positive than away teams when they go ahead, however they also become substantially more negative than the away teams when they go behind. Likewise, teams that win are generally more positive than the teams that draw when the teams are ahead. However, the teams that lose manages to stay more positive than the teams that win or draw when the teams go behind.

This study is the first of its kind looking at NVB in a sporting/football context and therefore builds on further research. Consequently, there is a need for more studies looking at football players' NVB and hopefully this study creates hypotheses for future research. With this study's findings we can imagine that a football player's NVB can have a considerable impact on their mental state or mindset. We can imagine that a player's NVB before, during and after performance can affect their expectations of their or others future performance and therefore have an impact on how they perform.

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# 1 Introduction

Football is constantly evolving, and clubs, teams, coaches, and players are constantly trying to find new ways to give themselves an advantage over their opponents. The importance of being able to maintain a high frequency of communication between teammates in football and create great team cohesion is recognised as an imperative part for any sports team to achieve higher performance (LeCouteur & Feo, 2011, p. 124). World-renown football periodization expert, Raymond Verheijen, said that footballers do this by gathering information by perceiving and communicating with their teammates, opponents and their surroundings both verbally and nonverbally (Shrum, 2016). This is one of the reasons why communication has been identified by researchers as perhaps the most essential part of team interaction in sport (LeCouteur & Feo, 2011, p. 125). Therefore, it is believed that it is imperative for football players to have the ability to perceive and interpret their teammates' signals to be able to read the game and build their actions with their team based on what they have perceived and interpreted (Williams & Jackson, 2019). This is called verbal and nonverbal communication. Verbal and nonverbal communication is an essential arbitrator of performance in team sports and yet there is little research on direct measures of communication in sport (Lausic et al., 2009).

In recent years, the psychological side of football has been given a more central part in trying to understand how the football players manage to achieve such a high performance as well as gaining a higher advantage. Still, psychology does not have as big a part in football as the technical, the tactical or the physical aspect. Therefore, there have not been done as much research on the psychological part of either the football players or the aspect of performance through psychology in football. A considerable part of how one can get an insight to the psychological part of football, is to look more at the football players' mental state. Football players' and teams' mental state in a game, can and most likely will have an impact on their performance (Williams & Jackson, 2019). One of the possible ways, for football player's or team's mental state to be shown throughout a match is by how they communicate and what emotions they convey to each other. (Furley & Schweizer, 2020). Furley and Schweizer (2014b) conducted a study which showed that basketball players' confidence in beating an opponent is influenced by the opponent's nonverbal behaviour (NVB). Taking all this into



consideration, it would be intriguing to look further into how football players interact with each other and how their behaviours on the pitch can be an insight to their mental state.

First, it could be compelling to look at interactions. Human interaction is a huge chase after meaning where they are constantly trying to perceive and understand what others are thinking, feeling or what their intentions are (Leathers & Eaves, 2015, p. 3). When communicating with others, people are constantly trying to evaluate and distinguish whether they have perceived correctly and precisely what the other person's intentions were. A struggle is that there can often be a difference between what you believe was communicated to you and what was actually being communicated (Leathers & Eaves, 2015, p. 4). The meaning or message behind the information that is sent from a person can be communicated by a variety of means. When talking about communication, one often think of verbal communication and the dialogs one has with others, but what is important to remember is that people do not solely communicate with words alone (Leathers & Eaves, 2015, p. 5). Individuals are more likely to have a hard time being able to communicate what their feelings and intentions are by just using words, in addition, some will even try to hide their real feelings or intentions. However, NVB most often reveal humans' true emotions, whether they are unable to express it themselves verbally or if they are trying to actively hide it (Leathers & Eaves, 2015). When it comes to NVB and nonverbal communication, it is important to distinguish between the difference between behaviour and communication. Nonverbal communication is every type of communicative act through every modality which is not expressed through words, where you actively are trying to communicate to someone (Wiener et al., 1972), while NVB is more of a subprocess of nonverbal communication and does not always have to be communicative (Matsumoto, Hwang, et al., 2013). NVB is considered as all types of movements or positioning of the body and/or face (Furley, 2021b). Human beings are constantly sending out nonverbal signals or bodily cues which give out some sort of information or message (Furley, 2021b; Furley & Schweizer, 2020). Watzlawick et al. (1967) argued "One cannot not communicate" (p. 51). As observers, one need to perceive and interpret the message, so it is possible to respond correctly to the information that is being received. Subsequently, this will again affect the social interactions one have with others.

NVB and nonverbal communication are a fundamental part of how one communicates with others. The big functions include providing information, regulate social interactions, express emotions and feelings, strengthen social ties, shape impressions and show intentions (Leathers

& Eaves, 2015, p. 23). Still, what happens when we link what we now know about nonverbal communication and behaviour to football? Can a footballer's NVB tell us anything about their relationship with their teammates or how they react to failure, success or other types of information? Furley and Schweizer (2014a) showed that humans can detect whether an athlete's team is trailing or leading, because they display NVBs as a consequence of whether their team is in the lead or behind (Furley & Schweizer, 2015). Consequently, would it be possible for football players to use their NVB to strengthen their bonds with their teammates and therefore give themselves and their team a better possibility to impact their performance?

## **2 Theoretical framework**

### **2.1 The functional effects of nonverbal behaviour and communication**

When it comes to NVBs relation in sports, there is a lack of an integrative theoretical framework to understand the complexity of human (nonverbal) behaviour (read Furley, 2021b for a review). To get a theoretical framework which can make it easier to understand the foundations and reasoning for this study, one first has to look at the complexity of human behaviour, before looking deeper into it in a sport and football context. Because of the incredible complexity of human behaviour, it will be nearly impossible to get anywhere near the entirety of what human behaviour is in this segment. Still, this section will attempt to describe the most essential functional effects that NVB has on communication, which can be tied to athletes' behaviours, before going deeper into the different theories.

Evolutionary approaches on human behaviour begin with the assertion that noticeable or observable behaviour serves some sort of function, where the fundamental function of behaviour is for human beings to become more adaptive (Furley, 2021b, p. 2). The functional significance of NVB and nonverbal communication is the creation of meaning (Leathers & Eaves, 2015, p. 6). The creation of meaning is related to (1) the purposes, (2) the accuracy and (3) the efficiency of which the meaning is communicated (Leathers & Eaves, 2015, p. 6). Nonverbal forms of communications has a greater functional significance than verbal communication for six principal reasons (Leathers & Eaves, 2015, p. 7). First is the determinants of meaning. Studies have shown that communication is approximately 65-95% nonverbal (Matsumoto, Hwang, et al., 2013; Tracy & Matsumoto, 2008). This shows us that nonverbal communication will be a more effective and much more accurate means of

communication as humans are not able to accurately convey meaning by just using words (Leathers & Eaves, 2015, p. 9). Second, feelings, emotions and intentions are more accurately exposed or revealed by nonverbal measures (Leathers & Eaves, 2015, p. 7). Davitz (1969) conducted several studies on emotional expression and concluded that nonverbal forms of expressing oneself best determines a person's emotional state. A study by Sternglanz and DePaulo (2004) confirms these findings and found that individuals with a higher relation, such as close friends and family, are better able to perceive and recognize the others nonverbal expressions of emotion as well. Third, NVB conveys meanings and intentions which are approximately free of deception/deceit, disinformation and distortion (Leathers & Eaves, 2015, p. 8). NVBs such as gestures, posture and facial expressions are rarely under sustained, deliberate control of the one communicating. In addition, not only do NVBs mostly reveal the communicators real meaning and intent, but their feelings and what they think of us as well (Leathers & Eaves, 2015, p. 8). Fourth, NVB serves a metacommunicative function which is essential in obtaining high-quality communication, because the communicator often provides supplementary cues or signals that further clarifies their intent and meaning. Fifth, NVB represent a much more efficient way of communicating than verbal means (Leathers & Eaves, 2015, p. 9). Evidence demonstrate that in a limited time frame, there are a few string of events that cannot be described more quickly and efficiently with gestures than with verbal communication (Leathers & Eaves, 2015, p. 10). Sixth, the nature of communication often indicate to us that ideas and emotions can be more effective indirectly than directly (Leathers & Eaves, 2015, p. 10). Meaning that emotions can often be easier expressed with NVBs rather than with words.

## **2.2 Encoding and decoding nonverbal behaviour**

### **2.2.1 Encoding nonverbal behaviour**

Encoding is the act of producing the nonverbal information, which could be either through physical appearance, posture, gesture, body position, touch, and lastly facial expression (Leathers & Eaves, 2015). Encoding of NVB is not based on the same rules as language production and does not follow a definite grammar (Furley, 2021b, p. 3). NVB is conceptualized to regularly vary along a continuum of controllability (Ekman & Friesen, 1969). NVB is both encoded deliberately and unintentionally. Although Wiener et al. (1972) pointed out that nonverbal communication have to involve encoders and decoders using a socially shared signal system or code with intent. NVBs that do not include intentional actions

by the encoders and the decoders may inform but they do not communicate. Thus, Ekman and Friesen (1969) indicated that nonverbal communication is NVB that is intended to be communicative. The question that then emerges is: would not all NVB be communicative whether it was intended to be or not, as long as there is someone to perceive it?

A person can communicate their feelings, thoughts and intentions through a variety of means. Weinberg and Gould (1999) came with 6 different ways of communicating nonverbally, which were physical appearance, posture, gesture, body position, touch, and lastly facial expression. Physical appearance is everything from your facial features to how you dress. A first impression only lasts approximately 5-20 seconds upon meeting someone (Krannich & Krannich, 2000) and this judgement is based mainly on clothing and facial features and expressions. Even though a first impression only lasts for 5-20 seconds, we humans will most likely use this to judge and make assumptions about what the person is like for several meetings after. Hence, a first impression can be vital and have a big impact on a person's relationship and their interactions with someone.

Posture is a person's stance or walk which are mostly in either a more erect position, with their heads up and making eye contact with several others or a more passive position with their heads facing down towards the ground, avoiding eye contact. Thus, a person's posture can tell us quite a lot about their confidence, self-esteem, self-image as well as their current mental state. Gestures are a NVB which is similar to posture but is often more expressive. Gestures are very often movements of the extremity of the body where a person can be moving their arms or legs or even head in different directions to communicate. Movements of the extremity, specifically hands and arms can often act as a window on the human mind, where they can make their thoughts visible (Beattie, 2004).

Body position is how a person positions themselves and how they use the space between themselves and the ones they are trying to communicate with (Smith & Strand, 2014).

Touching is closely related to bodily positioning and can send quite strong messages. As McKean (2003) wrote: "The smallest touch can communicate a humanness and warmth while breaking down barriers that few other nonverbal communication practices can replicate" (p. 168). Facial expression is the final form of NVBs which one uses to communicate. This can be everything from a smile or a frown to winking, raising one eyebrow or a sudden wrinkling of the nose. Eye contact is a very strong part of this type of communication. These six types

of NVBs make sure that what message we want to, or even do not want to send to others, is more detailed and precisely communicated to others.

### **2.2.2 Decoding nonverbal behaviour**

Decoding NVB is the ability to pick up the nonverbal cues and signals from others, interpreting them and then acting upon them (Matsumoto, Frank, et al., 2013). The cognitive system has become accustomed to bodily cues, since both nature and nurture seem to influence the decoding of NVBs, as NVBs seem to be naturally interpreted in a natural process (Furley, 2021b, p. 4). However, the interpretation of other NVBs is mostly influenced by our cultural learning (DePaulo, 1992). The proper decoding of nonverbal cues is one of the most important factors in securing high-quality communications (Leathers & Eaves, 2015, p. 9). Luckily, the cognitive system has become specifically accustomed to nonverbal cues and behaviour which are of general adaptive relevance. According to the information processing theory (Eysenck & Calvo, 1992), the information processing system of a person is hardwired to be able to pick up and decode information from nonverbal cues without needing any additional contribution of higher order cognitive processes (Furley, 2021b, p. 4). Studies suggest that both body related and face related cues signal past performance and perceivers can decode them even from briefly presented stills (Furley et al., 2019; Furley & Schweizer, 2014a, 2015). However, relying only on the decoder when it comes to NVBs and communication will put too much pressure on the decoder to be able to perceive and decode the cues and signals which are sent out by the encoder (Leathers & Eaves, 2015, p. 11). Inefficient nonverbal decoders, use a more restricted repertoire as a source of information compared with efficient nonverbal decoders and are less sensitive as well to the nonverbal cues they seek to decode (Leathers & Eaves, 2015, p. 22). When a person commits a NVB, the then encoder sends out signals and bodily cues, where the expectations of the decoder to perceive and decode the intentions of the behaviour are either met or not. If the decoder is not able to decode the behaviour's intention and the expectations are violated, the behaviour from the encoder might be perceived as ungenune (Ekman & Friesen, 1969).

### **2.2.3 Basic emotion theory**

NVB is assumed to individually transfer information about emotions and has led to the establishing of basic emotion theory (Ekman & Cordaro, 2011; Ekman & Friesen, 1969). The Basic emotions theory is the most common and profoundly rooted psychological theory on both emotion and facial behaviour (Crivelli & Fridlund, 2019; Ekman & Friesen, 1969). The

word basic when describing emotions is illustrated through two main characteristics, which can be differentiated from one another (Ekman & Cordaro, 2011, p. 364). One is that emotions are discrete, automatic responses which are distinguished essentially from one another to globally shared, culture-specific and individually-specific events. The second characteristic is the view that emotions have evolved through adaptations to our surroundings. Emotions are universally expressed in a person's NVB (Furley, 2021b, p. 4) and according to basic emotion theory, the code that describes how meaning is incorporated in a behaviour, is the rule that defines the relationship between the behaviour itself and what it signifies (Ekman & Friesen, 1969, p. 60). Emotions can be described as a coordinated psychophysiological reaction to specific events in the environment, rising to apparent actions or instincts which leads to human behaviour and resulting in the hunt of a related goal (Lazarus, 2000). Encoding of one's emotions can be either extrinsic or intrinsic, where extrinsic coding is where the behaviour means or represents something else, and the coding may be arbitrary or iconic. Whereas intrinsic coding is a sense of no code where the behaviour does not stand for its significance, but the meaning of the behaviour is intrinsic to the action itself (Ekman & Friesen, 1969, p. 60). You divide these two as three coding foundations: arbitrary coding (extrinsic), iconic coding (extrinsic) and intrinsic coding. Behaviours which are arbitrarily coded carry no visual resemblance to what they actually signify. An example would be the opening or closing of a raised hand signifying greeting or departure. Since the movement does not intrinsically show what the behaviour itself signifies, thus the coding is arbitrary. Behaviour which is iconically coded bring the clue to the decoder in their appearance as the NVB looks in some way like what it means. Behaviours which are intrinsically coded, like iconically coded behaviours, are visually linked to what they signify. However, the intrinsically coded behaviours do not resemble its significance.

#### **2.2.4 Behavioural ecology theory**

The most known rival theory to basic emotion theory is behavioural ecology theory (Crivelli & Fridlund, 2019; Fridlund, 1994). The basic emotion theory's scrutiny has escalated since the 1990's as NVB can communicate other kinds of information in addition to emotional information, such as values, personality dispositions, psychopathologies, physical states and cognitive states (Fridlund, 1994; Furley, 2021b). The roots of the behavioural ecology theory of facial displays are solidly biological and stem from modern conceptions of animal signalling (Crivelli & Fridlund, 2018, p. 392), whereas today the theory is now used for

describing and explaining facial behaviour. According to the behavioural ecology theory, NVBs, such as facial expressions, have no intrinsic meaning tied to their morphologies, nor are they dependent on any specific internal state (Crivelli & Fridlund, 2018, p. 388). The theory states that there is no one to one mapping of displays to emotions, alike the basic emotion theory suggests, because the same emotions may be accompanied by different motives under different circumstances (Parkinson, 2005, p. 284). Consequently, the prototypical anger expression will occur only if there is an overtly hostile intention and if there is a relevant audience to receive the message, but not necessarily in other circumstances where the individual might be angry. According to the Fridlund's (1994) behavioural ecology theory, NVB should be recognised as an instrument for communicating to others their social motives and behavioural intentions (like how an individual is likely to act in the future), rather than individuals using it as an instrument to just express their feelings or current subjective experience (referred to in Parkinson, 2005, p. 284). The behavioural ecology theory discounts the ideas that faces have a fixed morphology with a constant and unchanged meanings or that faces have meanings associated with particular sub-personal states, but rather that facial displays are social tools which have meanings within the interactions which again depends on the interactants, their aims within the interactions and their intentions and both the recent and historical contexts of their interactions (Crivelli & Fridlund, 2019, p. 183). Therefore, the most important function of faces according to the behavioural ecology theory is not what they are theorised to reflect or express or by what hypothetical instrument they are produced, but how they function in social interactions (Crivelli & Fridlund, 2019, p. 183). The behavioural ecology view of facial displays provides a useful alternative for researchers who notices the basic emotion theory's limitations.

### **2.3 Methodological approaches for encoding and decoding in sport**

There are three different methodologies which have been used to study the decoding and encoding of NVB, which is evaluative coding, descriptive coding and automated coding (Bente et al., 2008; Furley, 2021b).

#### **2.3.1 Evaluating coding**

Evaluating coding directly informs the observed behaviour into psychological categories (e.g., aggressiveness or friendliness of a behaviour) (Bente et al., 2008, p. 271). Within this approach, participants are asked to evaluate the internal state or other assumptions of a person by their nonverbal expression, which has been termed thin-slices paradigm (Furley, 2021b;

Furley et al., 2019; Furley & Schweizer, 2015). Using thin-slices paradigm means showing or being shown either still images or short second clips and then interpreting these short snapshot images (Furley et al., 2019). This method can be highly useful for the analysis of the effects of nonverbal communication. Evaluative coding does not provide descriptions of behaviour, but rather assessments of the appropriateness of certain psychological categories. The criterion of objectivity is substituted by the criterion of intersubjectivity, which means the quality of measurement is quantified via interrater reliability. This means that the goal of evaluating coding is to obtain subjective impressions of observers, hence, evaluative coding is not a very suitable method for describing behaviour nor as a tool for encoding studies (Bente et al., 2008, p. 272). Performance in the evaluative coding task will depend on a researcher's ability to experimentally control particular behavioural conditions and to isolate the influence of behavioural cues from other socially related information (Weinberg & Gould, 1999).

### **2.3.2 Descriptive coding**

In descriptive coding, NVB is quantified by trained coders who use a predefined descriptive coding system (Furley, 2021b, p. 5). Descriptive coding is the availability of standardized procedures for an unbiased and exhaustive notation of human motions (Bente et al., 2008, p. 272). The differentiation between descriptive and evaluative phases in the measurement process shows that NVB must first be described objectively, and then secondly, its interpersonal effects must be tested independently. However, because of this, we have to improve our methods in both directions. The advantage of coding systems is that they give clear-cut information on the actual bodily movements which are shown. However, there is a challenge to assign a meaning to the specific movements, as well as this procedure is highly time consuming. Methodological advancement in the field of body movement coding has been slower and more difficult due to the large degrees of freedom in whole body movements. The main problem in descriptive coding is the availability of regulated procedures for an unbiased and detailed documentation of human behaviour and gestures. This has mostly been overcome by for instance the facial action coding system (FACS) (Ekman & Friesen, 1978). Even though the system still needs coders, the systems make use of detailed behaviour protocols which enable high degrees of reliability and objectivity (Bente et al., 2008, p. 272).

### **2.3.3 Automated coding**

The automated coding approach uses technological devices such as computer-based motion capture or electromyography to estimate and measure muscle activity associated with NVB



(Hess, 2016, referred to in Furley, 2021b, p. 5). The benefit of using automated coding, is that it is much more time efficient, as well as giving better space resolution and being able to capture more subtle expressions. The downside of this approach is that the devices are often impractical for natural settings, as they require attaching sensors and the installation of stationary laboratory equipment (Bente et al., 2008, p. 272). On the other hand, computer simulations of NVB offer a quite exclusive possibility to solve both of the problems of traditional effects studies. They allow for quite a dynamic presentation of NVB research, as well as they offer the possibility of masking or changing aspects of physical appearance which might be indicative of the cultural background of the original encoder.

## **2.4 Nonverbal behaviour and self-presentation**

According to Jones and Pittman (1982), self-presentation is a matter of regulating one's own behaviours to create a particular impression on others. Self-presentation and the impressions we try to give others, is often done verbally where we try to 'talk ourselves up' (DePaulo, 1992), however, self-presentation can be accomplished nonverbally as well and there are several arguments why NVBs should be of special interest in the dynamics of self-presentation. When it comes to self-presentation, not every NVBs are autonomous, meaning sometimes people can control their expressions (Furley, 2021b, p. 4).

The study of NVB, even when pursued from a self-presentational perspective, has generally neglected what may be one of the most important issues in the field: the question of when NVBs can and cannot be wilfully produced (DePaulo, 1992, p. 203). It is typically assumed that production of desired NVBs and expressions are nonproblematic. Athletes in particular, are utilising some control over their NVB when they are interacting with teammates, opponents, referees or even fans and spectators (DePaulo, 1992; Furley & Schweitzer, 2020). One example could be when football players are putting their hands up towards the fans to signal "we are sorry" after losing a game. Although one do have some control over their NVB and know how to utilise it, because of the special characteristics of NVBs, the intention to produce a specific nonverbal expression, cannot always be successfully translated into the actual production of that exact expression (DePaulo, 1992, p. 203). Meaning, the expression we are giving to someone to try and communicate something, can be different to what that person's impression is when they are receiving the expression. This gives us questions such as: if one would want to convey different sorts of nonverbal impressions, how should they do it?

Motivation and confidence are just two of the wide multitudes of factors which can undermine or enable the successful production of NVBs for self-presentation purposes (DePaulo, 1992, p. 204). Although there have been statements about the complication or adversity of making a specific NVB (Ekman, 1985), there are many strategies that can convey specific impressions to others which can be communicated nonverbally. To give others the impression of inconvenience instead of incompetence, an athlete can try to signal to their teammates, coach and other spectators that they injured their leg after committing an unsuccessful action (DePaulo, 1992). By touching their leg for instance, they try to deviate the blame on the injury and claim it was the injury that was inhibiting them from performing and not the absence of talent or hard work. An athlete can be afraid of seeming passive or lazy and could concede to this solution to avoid teammates, coaches or fans from being frustrated but become more understanding instead (DePaulo, 1992).

NVB is irrepressible and one of the most interesting properties of NVB in social interaction is that individuals cannot refrain from behaving nonverbally (DePaulo, 1992, p. 205). If for example a person is passive in their behaviour and expressions in order to not reveal too much of their persona or self-presentation, they will likely be perceived as unexpressive, inhibited and withdrawn, which shows that even if a person succeeds in quieting their NVBs and cues, their static NVB still speaks loudly to the ones surrounding them (DePaulo & Kirkendol, 1989; Hall et al., 1987). No matter how one acts or behaves, others will form some sort of impression based on the manner of their NVBs which they are perceiving, whether one wants to or not.

A second argument is that NVB is linked to emotion (DePaulo, 1992, p. 205). Like the basic emotion theory, emotion and expression are theorised to be hard-wired linked between the eradication of certain emotions (e.g., anger, happiness, surprise) therefore triggering facial muscles which produce expressions of those emotions (Buck, 1984; Izard, 1977).

A third argument is that NVB is less accessible to encoders than to the decoders (DePaulo, 1992, p. 206). In most ways, we know more about ourselves and more precisely than others could. However, awareness is an important exception to this argument. A reason for this is we never see our own facial expressions exactly like others do. Therefore, in interpersonal interactions, one never knows as much about their own NVBs as the others who are interacting with them. Humans have access to internal signals and cues, such as feedback from their own muscle movements, which others do not, and other interactants may

sometimes provide feedback about others' expressive behaviours either directly through verbal cues or indirectly through NVBs (Ekman & Friesen, 1969). And through this feedback, one can get hints on how their NVBs appear to others. When one tries to convey a specific impression of themselves to others, the inaccessibility of their own NVB provides some constraints. Since one cannot see their own face, it is difficult to know exactly what impressions one may be conveying. This makes it difficult for people to regulate their behaviours on a moment-to-moment basis.

The fourth argument is that NVB is off-the-record (DePaulo, 1992, p. 206). To try and explain this, you have to look at the interaction itself. When interacting with someone it would be easier to count the words spoken in that interaction than it would be to describe a facial expression. In social interactions you might ask someone to repeat what they have said, but never ask that person to repeat the facial expression or body movement they just made. To the self-presenter, if they wanted to take a chance at expressing something nonverbally, should they later regret it, they can always deny the behaviour occurring or that it had any specific meaning to it. However, it is a lot harder to deny something that has been said.

The fifth argument is that NVB communicates a unique meaning (DePaulo, 1992, p. 206). Nonverbal expressions can communicate emotions and meanings that could never be expressed with words sufficiently enough. When it comes to self-presentation, certain identity-relevant impressions can only be conveyed through NVB. This could be a certain gimmick an athlete has, a specific stance or pose they mostly use, or even a tic. These are not possible to convey verbally and characterises the athlete.

The final argument is that NVB occurs quickly (DePaulo, 1992, p. 207). Many NVBs occur instantaneously, whereas it would take longer to formulate for instance an empathic response to someone that have just hurt themselves, than it would to react immediately nonverbally to the incident. It is often one's immediate reaction and response to different forms of stimuli or messages that seem often the most genuine than what one may convey verbally.

#### **2.4.1 Implications of the self-presentation perspective**

There are some implications which follow from the self-presentational perspective. It is predicted that literature and later studies on NVB will be consistent with these implications, although NVB is often generated from other perspectives than self-presentation (DePaulo, 1992, p. 211). The first implication is that individuals will try to regulate their NVBs.

Therefore, they rarely intend to let their NVBs be spontaneous and impulsive expressions of

their dispositions, feelings or internal states.

The second implication would be that adults generally have the skills needed to regulate their NVB effectively and successfully for self-presentational goals.

The third and perhaps one of the more important implications is that many NVBs are not easily or effectively produced or controlled (DePaulo, 1992, p. 207). Sometimes, one will not know which NVB that best conveys one's desired impression when they are interacting with others. Still, one will try to regulate their NVBs for self-presentational goals, where they attempt to claim an identity that can be found as profitable and which one thinks others will like or find believable (Schlenker, 1980; Schlenker & Weigold, 1989). The third as well as the first implication can result in individuals often trying to suppress their spontaneous and more accurate reactions and expressions of their internal states and rather try to convey what they believe is a more appreciated and desired impression while interacting with others. However, considering many NVBs are not that readily nor effectively controlled, more often than not, the most spontaneous behaviours humans convey, are the ones that will most likely show their true emotions and intentions, no matter how hard they try to suppress it (Schlenker & Weigold, 1989).

The fourth implication is that contextual nonverbal cues will vary in self-presentational relevant ways. When individuals or athletes are reliant on others to accomplish their goals, they often act differently towards them than they would if they were not in need of help from others (DePaulo, 1992, p. 211).

The fifth implication is that the regulation of NVBs for self-presentational reasons are learned (DePaulo, 1992). Subsequently, NVBs and strategies should vary systematically with socialisations such as culture, gender and age. Similarly, personality differences which have a high self-presentational significance, such as need for approval self-consciousness and self-monitoring could be powerful predictors for NVBs or styles.

The sixth implication on the self-presentational perspective is that nonverbal skills are not homogeneous (DePaulo, 1992). There are more circumstances where people will try to convey emotions or evaluations that are more positive than how they really feel, rather than circumstances where they try to convey evaluations that are more negative than what they really feel (DePaulo, 1992, p. 212). Our actions seem to follow our feelings, however, feelings and actions are in sync and by adjusting our actions, which is under control of our will, we can indirectly determine our feelings (James, 1911). Therefore, the implication is that

people will more often try to fake positivity as it will seem a more effective way of accomplishing something. Therefore, this implication has its similarities with the well-known phrase “fake it till you make it”, which suggests that imitating competence or happiness, can consequently make people actually achieve those things.

The seventh implication is that individuals’ success at using their NVBs to obtain an identity can be identifiable by their own skill to use NVB, but also the perceivers lack of willingness to go along with those identity claims (DePaulo, 1992). Goffman (1978) pointed out that people claim certain identities in their interactions with others which the perceiver will tend to honour. People tend to take others self-presentations at face value instead of trying to see through them and they expect others to do the same with them (Goffman, 1978). This is a characteristic that is more common with adults than with children (DePaulo, 1992).

Perceptions of the truth and reality become progressively accurate as we develop, and the years go by. As we get older, we get a better and more accurate understanding of the aspects of the world, space and time (DePaulo, 1992). However, this tendency to see what others want one to see rather than what is in fact true, can make it harder to perceive what is actually real or fake. Thus, in the domain of self-presentation, socialisation can result in a decline rather than an enhancement in the accuracy of perceiving body language (DePaulo, 1992).

The self-presentational perspective will have important limitations to the kinds of identities individuals will try and can successfully claim (DePaulo, 1992). People can vary their self-presentations effectively, though only to a certain extent within a certain range. Many of the limitations will be established in social reality as any person should be able to simulate an emotional state which they may not feel internally although it may not be as effective for some in relation to others. As humans, we are less effective at bluffing an emotion which conflicts with the emotion we are actually experiencing (DePaulo, 1992). DePaulo (1992) provided an example saying although any competent adult would be able to simulate extraversion, people who are really extraverts would be able to convey the impression of extraversion a lot more effectively than a person who is introvert. In general, the social world is more tolerant of the slightly altering of conveyed identities rather than the complete fabrication of new identities (DePaulo, 1992).

## **2.5 Studies on nonverbal behaviour in sport**

It is possible now to more confidently assume that nonverbal forms of communicating is one of the most valuable forms of interaction and communication, as well as perhaps the richest

source of knowledge and reliable indicator on other people's feelings, emotional states, and intentions (Leathers & Eaves, 2015, p. 7). In recent times, there have been conducted a few studies on how athletes' NVB before a match (before performance) can predict how they are going to perform (Bijlstra et al., 2020; Furley, 2021a; Furley & Memmert, 2021; Furley & Roth, 2021; Jordet & Hartman, 2008). An even fewer amount of studies have been made on athletes' NVB during a match (during performance) (Furley & Schweizer, 2014a, 2015; Lausic et al., 2009; LeCouteur & Feo, 2011). Most studies on NVB in sport have researched athletes' behaviour after performance and how their behaviour is a consequence of their performance (see Furley, 2021b for a review).

The importance of NVB and nonverbal communication can be explained through the six different methods of nonverbal communication (e.g., posture, gestures, facial expressions) in a football context. Physical appearance for a football player involves his or her haircut or hairstyle, how they dress or if they wear extra gear for a football match. A football player's physical appearance will send a message to the coach/manager, his or her teammates, the opponents as well as the fans (Smith & Strand, 2014). The physical appearance is a part of a football player's image and identity. If a footballer is wearing bright pink and yellow boots having a hairband with a big logo from his or her sponsor as well as taping their wrist, it can send different types of signals to his or her surroundings. The boots can signal that the player wants the newest football boots available and that he or she is sponsored by a popular brand. The hairband can give us the impression that the player wants their hair to look a certain way for his or her image, or the hairband just functions to prevent their vision to be blocked. The wrist tape could signal a sprain injury.

A first impression can leave quite an impact on how others perceive a person and if for instance a new signing comes in at their first match wearing a bunch of fancy and sponsored gear, they will probably provoke a reaction from some and they might get judged. Gesturing in football involves a lot of movements from the body and arms especially (Smith & Strand, 2014; Weinberg & Gould, 1999), where you try to direct teammates or make them aware of their surroundings. Gesturing can be used to increase teammates motivation, spirit and efforts when it might not go as well with their performance during a football match. A football player giving his or her teammates a thumbs up or applauding their efforts could help quite a significant amount when it comes to getting them to keep working harder to achieve their common goal, winning the match. Bodily position in football is mostly about the space

between players and the movements which they commit. As Leathers and Eaves (2015) stated: “Movement communicate meaning” (p. 79), which in football could be a player making a run towards the back post to communicate to their teammates that they want the ball to be played towards the back post of the goal. Or it could be a run to disguise a teammates run to the opposition, so that they do not mark the teammate. What direction a football player is facing can tell his or her teammates where he or she wants to receive the ball, or where they are going to make a run.

Although we often use the whole body’s movements when we want to send out bigger cues, still the smallest and simplest touch with another, can send out a substantially amount of intimate and complex signals, which the other NVBs cannot communicative replicate (McKean, 2003, p. 168). Touching can be intended and also interpreted as positive or negative. A high-five, a fist-bump, a comforting hand on the shoulder or a hug are all examples of how teammates can communicate togetherness and cohesion through touch (Kraus et al., 2010). A smack to the backside of a person’s head or a push are examples of how teammates can communicate frustration, anger or distancing (Furley & Schweizer, 2014a). In order to convey these messages and communicate to someone through touch, one has to get in another person’s intimate zone, which can send a strong message of care and closeness between two people, which is one of the reasons why touch is one of the most intricate nonverbal communication we humans have.

Where you have touch as the most complex form of nonverbal communication, facial expression is one of if not the most expressive part of a person, but still perhaps the hardest one to detect when analysing players from a far (Weinberg & Gould, 1999). Eye contact is the most dominating part of facial expressions and a very strong way to communicate through facial expressions. Eye contact is a sign of respect as it shows that someone regards another person highly enough to give them their full attention (Krannich & Krannich, 2000). Athletes in team sports such as football players will often use eye contact with their teammates to make sure they have understood each other and that their message has come across (Smith & Strand, 2014, p. 22). Other forms of facial expression could include a smile, frown or an eyebrow raise. One of the most common and telling facial expressions is a smile.

In the same way a football player’s facial expression can be revealing to observers, their body posture can show very similar signals of his or her confidence level, their self-efficacy, self-

image and self-esteem (Furley & Schweizer, 2015). A football players posture is heavily linked with success or failure (Furley & Schweizer, 2014a; Smith & Strand, 2014). A football player who has come up with some great performances recently and has been on a winning streak, would most likely have a much straighter posture with their head raised high, as they and their team entered the field before kick-off. Football players who have just lost or made a vital error, will most likely bow their heads down in shame or cover their face to try and hide and make themselves as small as possible. Furley and Schweizer (2014a) examined whether humans can detect whether athletes are trailing or leading based on thin slices of athletes' NVB. Results indicated that perceivers could separate between athletes who were leading or trailing in both team and individual sports. The findings suggest that humans display NVB as a consequence of leading or trailing, which can accurately be interpreted by others. There are athletes who have confirmed that their confidence in beating an opponent is often affected by the opponent's body language before or during a match (Furley & Schweizer, 2014b). Even commentators might mention how some players are oozing confidence and how much it is showing or how some players are hiding their faces in shame (Furley & Schweizer, 2014b). This shows that some can observe and perceive football players' NVB, hence it is possible to assume that one can decode footballer players' NVB through watching them in matches.

In football it is quite essential for football players to be able to anticipate how other football players surrounding them are going to act in the future, and then make decisions accordingly (Bergo et al., 2002). Therefore, in order to perform in football, it is crucial for a football player to perceive and decode what his or her teammates or opponents are signalling. This way they can read the game quicker and more accurately and build actions upon those signals. This is one of the main reasons why communication has been identified as such a vital part of cohesive team interaction (LeCouteur & Feo, 2011, p. 125). Communication can be a way for football players to help each other be ahead of the opposition, before potential situations occur (LeCouteur & Feo, 2011).

In the next three sections, this study will take a deeper look into the studies which have looked at how NVB before performance, NVB during performance and NVB as a consequence of performance might affect how we look at football players or how we look at the game.



### **2.5.1 Pre-performance behaviours – behaviour as a predictor of future performances**

How easy would it be to predict and anticipate how athletes are going to act in the future, based on the limited observations we have of their NVB? It is possible for the decoders to perceive and be given valid information from the encoder's NVB before performance. Therefore, one can predict the athletes' subsequent performance tendencies by their NVB (Furley & Memmert, 2021). There are studies that try to examine whether there is a direct link between athletes' NVB and their performance (Furley & Schweizer, 2020). However, limitations to the studies are that the athlete's NVB before or after performance are shown in still images or thin-slices and not what types of NVB the athletes are conveying in real time and through longer periods.

Furley et al. (2018) conducted a study focusing more on how we perceive the players NVB. They examined whether perceivers could distinguish who was playing home or away in football matches based on thin slices of professional and amateur athletes' NVB prior to the match. After distinguishing whether the players played home or away, the participants had to rate the players' assertiveness, dominance and aggression in their NVB. The participants could significantly separate between home and away teams' athletes. Results from the study also showed that the perceivers rated the home teams' players higher on confidence or assertiveness, dominance and aggression compared to away teams' players, regardless of being professional or amateur. The findings demonstrated that players change their NVB depending on whether they play home or away.

There are studies that have examined football players' behaviour before a penalty in a penalty shoot-out. Jordet and Hartman (2008) conducted a study to examine the relationship between football players' avoidance behaviours and the outcome of their performance (penalty kick) in a penalty shoot-out. They wanted to see whether football players' behaviours could predict and tell us the outcome of the penalty and consequently the penalty shoot-out. In Jordet and Hartman (2008) study they wanted to look at the penalties with a direct shot valence, meaning that the penalties had a direct negative or a direct positive consequence if the penalty taker scored or missed the penalty (a directly positive valence shot means that if the penalty taker scores their penalty, their team wins the penalty shoot-out and a directly negative valence shot means that if the penalty taker misses their penalty, their team loses the penalty shoot-out). The results in the study showed that penalty takers taking a directly negative valence shot, showed more avoidance behaviours and they missed more often than penalty takers taking a

directly positive valence shot as well. The results concurred with the results from Jordet (2009a, 2009b) which also showed that players with assumed higher status in the team showed more avoidance behaviour before taking the penalty kick, and consequently missed more often on the following penalty. Jordet (2009a) gave insight into the possible effects higher pressured tasks can have on more recognised and popular players with ‘superstar’ status. Although most of the studies on penalty-shootouts looked at the penalty takers, some studies examined the perception and appraisal of goalkeepers’ NVB and on the goalkeepers’ appraisal of the penalty takers (Furley et al., 2012; van der Kamp & Masters, 2008). Furley et al. (2012) looked at goalkeepers appraisal of penalty takers’ NVB and the study showed that football players who showed some form of dominant NVBs were perceived more positive and confident and were therefore expected to perform better by the goalkeepers, than the players showing a more submissive body language. Unlike the study of Furley et al. (2012), van der Kamp and Masters (2008) looked at the goalkeepers’ posture and other NVBs to examine whether it could affect the penalty taker’s perception and appraisal of the goalkeepers’ size and therefore affect their own behaviour before and during the penalty kick. They looked at whether a goalkeeper imitating and mimicking of Müller-Lyer configurations, would have an influence on where the penalty taker ended up trying to put his or her penalty kick. The Müller-Lyer illusion is an optical illusion, where two lines that are of the same length, seem to be at different lengths because of which way the arrows attached to the lines are facing (Müller-Lyer, 1889). Goalkeepers mimicking Müller-Lyer configurations are moving their arms in a certain way to make themselves seem bigger to the penalty taker (van der Kamp & Masters, 2008). These two studies generate the question whether NVB can create visual configurations that can have an influence on your opponents or teammates, which could give your team some sort of advantage.

Another NVB which has been looked at in a sporting context is touch and how teams use touch during a match. One study that got a lot of attention was a study on NBA team cohesion conducted by Kraus et al. (2010), where they demonstrated how crucial NVBs such as tactile communication or physical touch was at predicting a team’s future performances during a season. They looked at 12 specific types of touches, such as high-fives, fist-bumps or hugs, which they identified as promoting or being an indicator of cooperation. They focused on touches which occurred when two or several players were in the midst of celebrating a positive play which helped the team. Results showed that teams who showed a higher

frequency of touches in matches and early in a season, tended to perform better throughout the season and end up higher on the table. This study demonstrates that NVBs such as touch, can be a factor for helping with performance in a competitive group setting.

### **2.5.2 Nonverbal behaviours during performance**

There have been done some studies on how emotional behaviours can affect performance by looking at post-match statistics (Lefebvre & Passer, 1974; Varca, 1980). Varca (1980) explored the frustration-aggression model (Dollard et al., 1939), as an explanation for basketball teams committing fouls. The frustration-aggression model indicates that frustrations can create aggressive impulses, even when they are not irrational or aimed at the subject personally (Berkowitz, 1989). Therefore, Varca (1980) study examined whether increased frustration would result in increases in aggressive plays (e.g., fouls, steals, blocked shots etc). They looked at the difference in what was operationalised as aggressive behaviours between the home and away teams. The study's findings suggested that the higher the difference between winning percentage at home and away, the higher the likelihood of a team committing fouls when playing away from home. An interpretation by Lefebvre and Passer (1974) was that football teams that are playing away from home, commit more fouls, because playing away from home is looked at as a frustrating experience, which again results in more aggression and consequently more fouls are then committed. Varca (1980) explained that the differences in aggressive behaviour could be because of referee bias or what the players perceive as referee bias. It has been confirmed that referees are responsible for the perceived home advantage in the Premier League (Boyko et al., 2007), and they can be affected by the home supporters' reactions, cheering and harassment and therefore give more decisions in the home team's favour and therefore giving them an advantage (Gómez-Ruano et al., 2021; Goumas, 2014).

When it comes to NVB, there have not been conducted that many studies on what types of nonverbal communication the athletes do during performance and in a match (LeCouteur & Feo, 2011). It is possible football players' methods of communicating nonverbally is through their movements and techniques, which can have a more direct effect on their performance with or without the ball. Alternatively, the NVB by players or even coaching staff can have either a tactical or emotional agenda due to a particular event, which illustrates their emotional aroused state during that particular event (Leitner & Richlan, 2021). Lausic et al. (2009) and LeCouteur and Feo (2011) conducted studies where they examined a team's

communication during play. Lausic et al. (2009) explored the communication in the NCAA division 1 in female tennis double team, while LeCouteur and Feo (2011) examined elite netballers during defensive play. Lausic et al. (2009) wanted to look at the difference in communications between winning teams and losing teams, as well as the communication patterns preceding winning outcomes and losing outcomes. The results revealed that communications were emotional or action statements. They also revealed that winning teams displayed significantly different communication sequences than the losing teams. More precisely, winning teams had a more consistent model of communication. Furthermore, winning teams exchanged twice as many messages as the losing teams. However, the results revealed that there was essentially no difference between the patterns of communication preceding winning or losing outcomes across winning and losing matches. LeCouteur and Feo (2011) results showed that communication occurred at a higher frequency, when the opposition's players successfully managed to have shots at goal. Communication was proved to be critically dependent on the communicator considering, in their verbal and nonverbal behaviour, their teammates' orientation and visual access to the defensive situation.

The intention behind a NVB can be to have an ambiguous influence on their team's or their own performance. In football, you have two teams that are constantly trying to interfere with the other team's plans, while striving towards their own. Consequently, because of this counterplay by the opposition, football players will on several occasions try to withhold and even camouflage the real intentions of their actions to try and mislead and thereby outperform their opponents (Schmidt et al., 2018). This can be done by bodily movements or even postures which have several names such as fakes, deceptive movements or disguised actions (Güldenpenning et al., 2017; Jackson et al., 2006; Kunde et al., 2011). There are many different methods football players use to try to deceive their opponents and gain an advantage over them. Examples of fakes or deceptive movements in football can be body feints where a football player either with or without the ball where the player goes one direction before moving a different direction to try and mislead his or her opponent to move the previous direction to try and shake them off (Güldenpenning et al., 2017). Another typical disguised behaviour footballer players make to try and mislead their opponent, is to direct their gaze or their body towards a specific direction or teammate but pass the ball in a different direction to hide what their real intention was (Kunde et al., 2011). In other cases, football players will try to camouflage their actions to their opponents while simultaneously trying to communicate

their actual intentions to their teammates (Jackson et al., 2006). An example of this can be where a football player is about to make a run in to the box in front of the opposition's goal when their teammate has the ball out on the wing outside of the box. He or she is trying to get past an opponent who is trying to mark him or her and prevent him or her from receiving the ball. The football player then tries to make a run in front of the opponent when the opponent is paying attention to him or her, while simultaneously pointing discreetly behind his or her opponent's back to signal to his or her teammate where he or she is actually going to make the run and wants to receive the ball. Right before the teammate crosses the ball, the football player will change direction and run behind the opponents back into the box, while the opponent is most likely paying attention to the ball and thus will not catch the change in direction from the player. As a result, the attacking player gets to the ball before the opponent and maybe even gets a goal. In team sports such as football, athletes' behaviours are often reactions to other athletes' movements, which happened just seconds earlier (Kunde et al., 2011, p. 110). For this reason, football players will often make one movement first to provoke their opponents to react and move accordingly, before they perform their actual intended action to outmanoeuvre their opponents (Wright et al., 2013).

Leitner and Richlan (2021) conducted a study to look more specifically at what types of NVB the football players do and examine what effects a missing audience (so-called "ghost games") during the covid-19 pandemic had on their emotional behaviour and experience. They used a newly developed "Analysis System for Emotional Behavior in Football" (ASEB-F) where they compared the nonverbal behaviour (NVB) of players, staff and officials in FC Red Bull Salzburg for the 2018-19 season with regular games and in the 2019-20 season with "ghost games". The analysis system consisted of consecutive categories which occurred in situations in the football match. The categories were "events", which stands for specific events in the environment which led to the category "behaviour" and then "extra behaviour" representing the psychophysiological reactions that arose to actions. The category "participants" documents involved stakeholders and lastly "consequences" described related implications. The study's findings revealed that 19.5% fewer emotional situations occurred in "ghost games" and players and staff tended to involve themselves less actively and emotionally in behaviour in "ghost games". They made the emotional situations' duration shorter in the games without supporters than in the games with supporters as well. The results

indicated that players and staff in particular behaved predominantly less emotionally in “ghost games” than in regular games.

### **2.5.3 Post-performance behaviours – behaviour as a consequence of performance**

The NVB of athletes will often change depending on whether the athlete have performed a successful action or not, whether their team is trailing or leading or whether they won or lost a match (Furley & Schweizer, 2020, p. 1206). Several studies use what is termed thin-slices paradigm (see section 2.3.1 evaluative coding for definition), which argues that it is possible to perceive and therefore decode and differentiate between different NVBs which are shown after successful and unsuccessful actions and performances (Furley et al., 2019; Furley & Schweizer, 2014a, 2015). Evidence suggest that football players tend to leak information about their emotional state when they react to success or failure as their NVB start to change (Furley & Schweizer, 2020, p. 1206). The findings in these studies show that in case of victory, athletes will when facing an opponent, change their NVB to assert dominance and communicate and show pride (Furley & Memmert, 2021; Furley & Schweizer, 2014a, 2015), while in the case of defeat, show submissiveness and even shame (Furley et al., 2019; Furley & Schweizer, 2014a). These types of changes in NVB is something one can perceive and decode (Furley & Schweizer, 2015; Matsumoto, Hwang, et al., 2013).

Other studies have looked more at the specific NVBs athletes do post performance. Bornstein and Goldschmidt (2008) conducted a study where they wanted to examine whether the post-performance behaviours football players committed could be an indication on the team’s cohesion levels and whether there was an association between the post-performance behaviours the football players performed after the team scored a goal and where the team would end up on the table throughout the season. In this study they looked at what they operationalised as team-oriented behaviours such as attending to teammates, walking to the centre of the field and making a lot of physical contact with many teammates after a goal was scored. The results showed that teams whose goal scorers showed more team-oriented behaviours, tended to end up higher on the table at the end of the season, than teams whose goal scorers showed less team-oriented behaviours and more self-oriented behaviours after scoring a goal. They suggested that post-performance behaviours, could be an indication of a team’s cohesion level and how well the players work and fit together as a team. This study asks the question of whether post-performance behaviours could affect cohesion or if it is more of an indication or consequence of good cohesion. Will more team-related NVB in a

team create better cohesion and therefore better performances? This makes it uncertain whether the display of NVBs can affect a team's cohesion that will again affect their performance, but we do know that football players with a high level of cohesion, will show more team-oriented behaviours after successful performances (Bornstein & Goldschmidt, 2008).

There are also studies that have looked at what the consequences of those behaviours can be. Moll et al. (2010) wanted to investigate the association between celebratory behaviours and responses after successful penalty kicks in a penalty shoot-out and the following outcome of that shoot-out. They looked at the individual NVBs displayed, especially big celebrations, after the players had taken a successful penalty kick. Results showed that football players who celebrated especially with their arms to make themselves big after scoring their penalty, were more likely to be at the winning team at the end of the penalty shoot-out. They also found out that when football players made themselves big with a passionate celebration, it often had a negative influence on the opposition's next penalty taker and penalty. Since the study's findings showed that these types of behaviours could have a negative affection on the opponent, you could argue that NVBs could have quite a contagious effect on others who are observing the behaviours. Observing teammates showing such passionate and affectionate emotions, could strengthen their own focus and concentration, consequently making them perform better when they are stepping to the penalty spot (Moll et al., 2010). The findings of this study can provide strong arguments for both NVB being a predictor of future performance as well as NVB being a consequence for performance. On one hand you have football players' NVB affecting the opponent's next penalty and being able to predict the outcome of that penalty, whereas on the other hand the NVB that the players are displaying, are a consequence of their own successful performance.

## **2.6 Research question**

The main aim of this study was to provide an overview of how football players in the Premier League use their nonverbal behaviour (NVB) to communicate with their teammates, the referee and others during a match. A goal was to categorise the players' NVB and hopefully understand its connection to the players' psychological and emotional state. Further, the goals of this study were to answer the following questions:

1. What characterises a player's and a football team's NVB in a football match?

- a. What characterises the NVB in a football match?
  - b. What characterises the different player positions' NVB?
  - c. Does playing home or away affect a player's NVB?
  - d. What characterises the NVB to the teams that won, drew or lost?
2. Does the team you play for affect your NVB and does it change as the score changes during the match?
    - a. How does the tactical NVB change when a team is ahead, level or behind?
    - b. How does the emotional NVB change when a team is ahead, level or ahead?

## 3 Method

### 3.1 Design

This study is a non-participatory observational study where football players in the Premier League are observed during a football match through video footage. This study is part of a bigger project where both players in the Premier League and the Women Super League were analysed. This study intended to look at the players' NVBs throughout an entire 90-minute football match. The design of the study consists of observing all the teams in the Premier League for one game only and all the players that played for the matches that were analysed. The study looked at the players tactical and emotional NVB. Both the tactical and emotional demeanours in this study are limited to the players arm-movements. Reason why they have been limited to only arm movements, is because for about 50% of the game you can only observe the analysed player from the back or the far side of the pitch. It is therefore impossible to analyse small details such as facial expressions if the player can only be seen from their back or from afar. Therefore NVBs were limited to arm movements since they extend from the player's body and are easier to see from the far side of the pitch. This study will therefore give us a slight overview of what types of NVBs football players in the Premier League convey throughout a football match. The reasoning for it giving us not an entire overview of the NVB the players convey, is because NVBs have been limited to only arm-movements as well as the teams and players are analysed for only one match and not throughout an entire season. Descriptive coding was the method used to analyse the NVB of the football players. Therefore, the term NVB was quantified by trained coders (master's degree students) who used a predefined descriptive coding system made together with a team from the Norwegian School of Sport Sciences.



The video analysis gives us the ability to rewind the footage, look closely into each individual player and therefore make it easier to get a thorough analysis and not miss any behaviours.

## **3.2 Selection**

### **3.2.1 Premier League**

The sample selection were football players who played for one of the 20 teams in the English Premier League in the 2021/2022 season. 271 players were analysed (M=26,4 years, SD = 3.88). 13 of the teams, had 14 players being analysed, 5 of the teams had 13 players being analysed, and 2 of the teams had 12 players being analysed. Observing the players in the Premier League can give us a baseline for how football players' NVB is at the highest level. The reasonings for believing players from the Premier League can give us the baseline, is because it is the highest division in men's football in England, as well as being the highest ranked league in Europe (UEFA, 2022). Another argument for this is in the last 5 Champions League finals, there have been 6 teams from the Premier League. And in the last two international championships, England have reached a World Cup semi-final (2018) and a European Championship final (2021).

### **3.2.2 Inclusion and exclusion criteria**

Before the analysis could begin, there were two inclusion criteria for a match to be selected for analysis and as well as an exclusion criterion where matches were excluded from analysis after being selected. The first inclusion criteria were that the matches being analysed had to have a maximum of 2 goals differentiating the teams at full time. The reasoning for the first inclusion criteria was that it is believed that contextual factors will affect a football player's NVB. In the Premier League, teams very rarely come back from a 3 goal deficit or more (Smith, 2017). When a team gains a 3-goal lead, they win 98.2% of the time, draw 1.4% of the time and lose 0.4% of the time (Smith, 2017). Furley and Schweizer (2014b) study showed that athletes' confidence in beating an opponent is affected by the opponents' score-related NVB. Therefore, it was concluded to have no more than 2 goals separating the teams, at least at full time. It seemed logical that a football player's NVB would differ too much from their normal behaviour in a match where the goal difference was too high, as the match would seem already over. There was a preference to look at the football players' NVB when they were in a tight match where there was still everything to play for up to the final whistle to make sure that a top-level performance is at the utmost importance for the players. None of the matches selected had a 2-goal difference in the game for more than 55 minutes.

The second inclusion criteria for a match to be selected was that the match had to be available in both broadcast view and tactical view and have good enough footage quality for that said match. The footage used to analyse the players had to be good enough to observe the players from all over the pitch. There were two matches that had to be excluded and replaced after being selected, because there were either not good enough footage from either the broadcast view or the tactical view or the match was excluded if the tactical view did not show every player enough throughout the match.

### **3.3 Data collection**

#### **3.3.1 Pre video analysis**

The collection of data from this study was of professional football players from the Premier League and this study was a part of a bigger project where players from both the Premier League and the Women's Super League were analysed. The Premier League has 20 teams and the Women's Super League has 12 teams, and in this project, all teams were analysed throughout 22 matches where 14 matches were from the Premier League and 8 were from the Women's Super League. Of the 14 matches chosen from the Premier League which were used for this study, in 6 of them both of the teams that played were analysed. In the other 8 matches, either just the home team or the away team got analysed. Of the teams being analysed in their matches, there were 5 teams who won their match, 7 teams who lost and 7 teams who drew. Of the matches analysed there were 2 home victories and 5 home defeats, 3 away victories and 3 away defeats and finally 4 home draws and 3 away draws.

The camera footage and the different views of the matches was provided by TV2 broadcasting. The data was collected through the analysis program Sportscode. The two different video files of the footage views were imported to Sportscode. After the video files were imported, they were assigned to angles, meaning they were put right next to each other on the screen, making it possible to watch the two views beside each other. The video files were then attached to a timeline, where all the registered behaviours to the analysed player was shown. Before the analysis could start, the footage had to be synchronised with the timeline, so that the noted time of occurrence on the timeline matched with when the behaviour occurred in the match and was shown on the screen.

#### **3.3.2 Post video analysis**

There were a total of 41845 registrations made in the analysis. There were a total of 271 players being observed, although 220 90-minute sequences were analysed. Meaning, 169

players played a full match, while 51 players came on from the bench and therefore another 51 were substituted out. On average a player was analysed for 79 minutes. In the selection there were 14 matches which were analysed.

After the analysis, three different spreadsheet files which contains the record of all of the football player's registered NVBs, would be exported into an Excel spreadsheet. Two of the three files were exported into an Excel spreadsheet, while the last file was exported into a CSV file for later analysis for the project. The two files exported to Excel were the ones used for further analysis and tests for this study (called player matrix and player timeline). After the files had been exported, further context (e.g., which team won, if the analysed player got a yellow card, if the analysed player scored etc) of the team, players and match was filled in as different variables on the player timeline spreadsheet. After every player had been analysed, all the player timeline Excel files were put into one single Excel file and all the player matrix Excel files were put into a single Excel file as well. The timeline file contained of categorical data, while the matrix file contained of continuous data. After every single player file had been exported to those two Excel files, they were again exported to the statistical program SPSS, giving us two sets of data for the statistical analysis and tests to conduct.

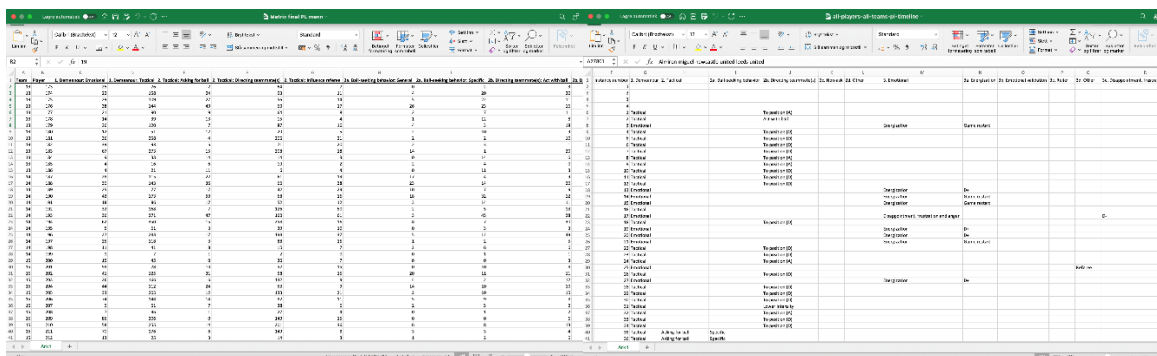


Figure 1 showing the two different files where the matrix file (left) has continuous data where it shows the number of registrations in each variable, while the timeline file (right) has categorical data because it shows what type of NVB it is and the context for every registration to the players.

### 3.4 Video analysis

#### 3.4.1 Hudl Sportscoder

The Premier League matches were analysed by 6 different coders, where you had three main coders (master's degree students including the author of this thesis), two assistant coders (bachelor's degree students) and an experienced coder. Of the 20 teams, the author of this thesis analysed most of the Premier League teams with 10.5 teams, the second main coder analysed 4 teams, the third analysed 0.5 team, the assistant coders analysed collectively 4

teams and the experienced coder analysed 1 team. The matches were analysed with footage from two different camera views, called broadcast view and tactical view. Tactical view was from a camera on one of the longer stands of the stadium and captured almost the entire pitch, making it possible to observe every player on the pitch at once most of the time, while broadcast view is the same footage as what is being telecasted to the public, giving the coders several different camera angles, depending on what the tele broadcaster wanted to show at that particular moment. This meant that in broadcast view there would be times where it was possible to get a zoomed in footage of the players and having footage being replayed again. The two different video files were uploaded to the analysing program, Sportscodel where the two files would be aligned, giving the coder both views on the screen at the same time. The tactical view gave us a bigger context around the gesture like who it was towards, what the gesture was a reaction to, and where on the field the analysed player was when making the gesture for instance.

The broadcasting footage was used to get better close ups on the players to make it easier to analyse the meaning and message of the gesture, which would normally not be as clearly visible from the tactical view. Sometimes players would make gestures with just their hands, like a thumbs up, which could be only visible on the broadcasting view. The analysed players would not always be visible at broadcast view, which was why tactical view was needed to make it possible to analyse the players throughout an entire 90-minute match.



*Figure 2 Illustration of Sportscodel's split screen function making it possible to have an tactical overview (left) of the players and a more close-up view (right) to analyse their gestures further.*

### 3.4.2 The code window

The analysis on the players were done with a code window attached to Sportscodel on a second monitor/screen. The code window contained contextual, tactical and emotional

variables. Most of the code variables were linked to each other, meaning it would be possible to connect the entirety of the context to the one behaviour the football player does at that exact time. When analysing a player, every time they would do an “unnatural” movement with their arms and hands that could not be characterised as “natural” movements (arm movements when you walk, jog or sprint), that behaviour or gesture would be registered and an analysis of that exact gesture would be done, and the coder would through the code window give context to the gesture. The context would be variables such as in which of the two views can you see the player, was the player’s team in possession of the ball or not, what was the score at that exact time, what size, intensity and duration did the gesture have. After the context of the behaviour had been given, the coder would assess whether the gesture and demeanour was a tactically or emotionally directed and then to whom the gesture was pointed towards. The tactical variables show us what type of instructions the football player is giving to their teammates and the emotional variables show us what the behaviour was a reaction to. Every registration was placed on a timeline on Sportscoder making it possible to see what time during the match the players make these behaviours.

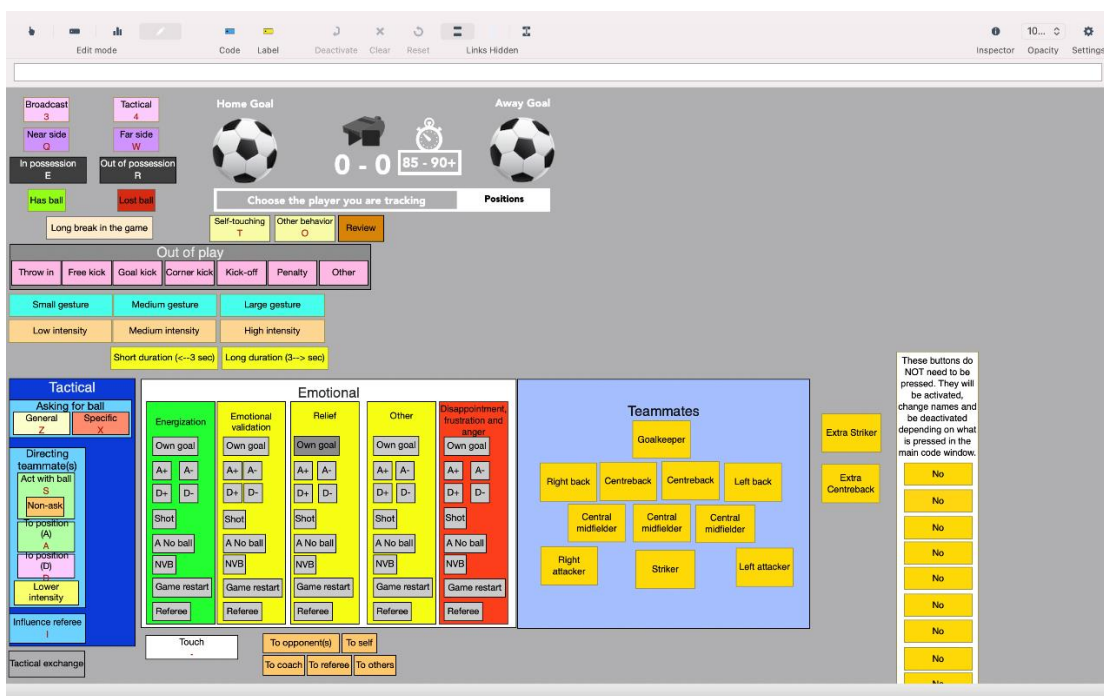


Figure 3 Code window with the variables used for the analysis. Every variable is connected where the variables in the top give context, while the lower variables describe the NVB.

### 3.5 Validity

Validity is whether the instrument used can measure what the ones conducting the study wants to measure (Field, 2013). When it comes to validity, there are three different forms of validity; concept validity, internal validity and external validity, which all determines how strong a study's validity is (Laake et al., 2013). Term validity or concept validity involves the very concept that is being studied. When it comes to concept validity, it is vital that the operationalisation of the terms being studied are precise and easy to understand. In this case, the concept is NVB. Wiener et al. (1972), Furley (2021b) and Matsumoto, Hwang, et al. (2013) as well as having a full team of personnel from Norwegian School of Sport Sciences helped define NVB before conducting the study. Term validity is important to make sure that there is no doubt from the coders what they are looking for when analysing the players and so that the reader of this thesis knows exactly what has been studied. NVB is not a new concept to the sporting world, even though the studies conducted on the term is very limited.

This study tries to be ecologically valid when analysing football players NVB, because it tries to highlight the findings in a real life setting (11v11 real football match) with the instruments that have been chosen (Everett & Furseth, 2012). The study's validity should therefore be as strong as studies conducted in laboratories studying athletes or football players (Aksum, 2016) and as this study has looked at the players' NVB in an actual match and not tried to fabricate their reactions in a laboratory, it should be as valid as the previous studies on the same topic.

The internal and external validity involves whether you can call the conclusions drawn from this study as valid or not (Laake et al., 2013). The internal validity involves the study's statistical tests and its statistical validity. This involves doing the right tests and reading of the results and measurements correctly, to avoid any possibility of a type I- and/or type II-error (Laake et al., 2013). To make sure that the results and measurements have been read off correctly, all the coders have gone through a IBM SPSS course with the Norwegian School of Sport Sciences a full term, as well as getting supervision and guidance during the statistical analysis from staff at the Norwegian School of Sport Sciences and the book "Discovering statistics using IBM SPSS statistics" (Field, 2013).

The external validity is to what extent one can generalize the findings of a study to other selections, settings and/or measures (Laake et al., 2013). The study conducted analysed

football players during a football match in the Premier League, the highest ranked league in Europe. It would be logical to assume that this study could (since the players were analysed by observation during a match) be recreated on football teams in other leagues across the world as NVB is a natural human behaviour as stated from the basic emotion theory (Ekman & Friesen, 1969). However, how generalizable the results are, is another question that remains to be answered.

### **3.6 Reliability**

Reliability is whether the research work operations from the study are done accurately (Everett & Furseth, 2012). Specifically, reliability for this study relates to whether the instrument being used have been interpreted correctly by the study's author (Field, 2013). In this study, one intra-observer reliability test (IAOR) and three inter-observer reliability (IOR) tests were conducted. There were a total of 6 coders, where one was an experienced coder, three coders (master's degree students, including the author of this thesis) and two bachelor students. The IAOR test was conducted by the main coder (author of this thesis) and the IOR tests were conducted by every coder involved with the analysis. Since this study would look mostly on what types of behaviours the players did (nominal data), the Cohen's Kappa was used in both the IAOR and IOR tests to make sure the coders had interpreted the behaviours the same. The Kappa coefficient is a measure of the agreement between the coders when categorical data is being used (Cohen, 1968). The kappa coefficients (k) values strength of agreement as very good when  $k = 0.81-1.00$ , good when  $k = 0.60-0.80$ , moderate when  $k = 0.41-0.60$ , fair when  $k = 0.21-0.40$  and poor when  $k < 0.20$  (Altman, 1991, p. 404). For these reliability tests to be successful, the most important thing was that the different coders had first of all observed the unnatural arm movements and registered them as NVBs, getting a minimum of good agreement between the coders. The second most important thing was that the different coders got a minimal of good agreement when it came to what demeanour the NVB had. Hence, for the variables being tested, the Kappa coefficient of agreement between the coders has been assessed (Hallgren, 2012).

#### **3.6.1 Intra-observer test (IAOR)**

In the intra-observer reliability (IAOR) test, the main coder (author of this thesis) performed a second analysis of a football player for a full game 4 weeks after the initial analysis. In the IAOR test, every variable registered was matched up with the original analysis to check the percentage of conformity in the two analyses. In the first analysis a total of 194 registrations

were made and in the second analysis 199 gestures were registered. Therefore, the timecodes of the registered gestures had to be matched up with the initial analysis' timecodes to make sure that the same gestures had been registered in both analyses. With the gestures that were registered on both analyses, the contextual variables in the test, such as "source" (e.g., tactical or broadcast view) had a very good strength of agreement ( $k = 0.98$ ), while "pitch location" (e.g., far side of the pitch or near side of the pitch) also had a very good strength of agreement ( $k = 0.95$ ) and "playing phase" (e.g., in possession or out of possession) had the strongest agreement ( $k = 1.00$ ). When it came to variables describing the movement itself, gesture intensity (e.g., low, medium and high) had a good strength of agreement ( $k = 0.80$ ), gesture size (e.g., small, medium and large) had a very good strength of agreement ( $k = 0.90$ ) to the initial analysis and movement duration (short duration  $\leftarrow 3$  sec and long duration  $3 \rightarrow$  sec) had a very good strength of agreement ( $k = 0.84$ ) as well. When it comes to the demeanour of the gesture, there was a very good strength of agreement ( $k = 0.97$ ) on whether the demeanour was tactical or emotional. When it came to what type of tactical demeanour the gesture had, the strength of agreement was very good ( $k = 0.86$ ). When it came to what emotional demeanour the gesture had, the strength of agreement was good ( $k = 0.76$ ).

### **3.6.2 Inter-observer test (IOR)**

Two of the IOR tests was conducted before the initial analysis started (in the pilot testing phase) and the third was conducted after the analysis was finished. In the pilot testing the three coders did an IOR test with the expert coder and a separate IOR test was conducted between the bachelor students and the expert coder. The IOR tests had to be done before the initial analysis could start. In the pilot IOR test, the three coders and the expert coder analysed the same player in the same match for the first half of the football match. The main coder had the most registered gestures with 148 registrations of the analysed player, while the other coders had 125 and 143 and the experienced coder had 133. Of all the registrations the experienced coder had registered, the main coder had 93% conformity when it came to register the same situations. Whereas, when it came to the demeanour of the registered NVBs, the main coder had a good strength of agreement ( $k = 0.74$ ) with the experienced coder. There was only 3,9% of the main coders registered gestures, which no one of the other coders had registered and there was only 3,4% of the experienced coder's registered gestures, that the main coder for this study had not registered.



At the point of the third IOR test, the three coders had analysed more matches and players than the expert coder had at the point of the first two IOR tests, thus were qualified as experienced coders. Hence, the now experienced coders did the last IOR test comparing each other's conformity on the data and not with the expert coder. The IOR strength on tactical demeanour was very good ( $k = 0.81$ ) between main coder and second coder and the IOR strength was good ( $k = 0.75$ ) between main coder and third coder. The IOR strength on emotional demeanour was good ( $k = 0.70$ ) between the main coder and the second coder and good ( $k = 0.80$ ) between the main coder and the third coder.

### 3.7 Variables

A team from the Norwegian School of Sport sciences including the three master's degree students, got together 5 months before initial analysis began and went through the types of NVBs the people in this project wanted to look at as well as the context to them. Further, the NVBs were categorised into variables and then operationalised in a code book to be able to conduct this study. Every single variable that was in the code window was given a definition, making it clearer for the coder to identify when he or she would choose the variables when observing the players. All of the variables are operationalised by arm movements which are looked at as "unnatural" arm movements. Natural arm movements when running, jumping or stopping have not been analysed.

#### 3.7.1 Contextual variables

The contextual variables are what describe the situation around the player's NVB when the behaviour occurs.

*Table 1 Definition of the contextual variables used.*

Variable	Value	Definition
Playing phase	In possession	Press this button when the analysed player's team is in possession of the ball when a behaviour occurs. Being in possession of the ball was operationally defined as the period that the analysed player's team had control of the ball until they lost possession to the other team, the ball goes out of play, or a free-kick is awarded.  We operationalized that a team had control of the ball when a player made two or more touches or was able to make a controlled pass/shot using his first touch.
Playing phase	Out of possession	Press this button when the opposition team is in possession of the ball when a behaviour occurs. Being out of possession was operationally defined as the period that the analysed player's team did not have control of the ball until the

		<p>opposition team lost possession of to the analysed player's team, the ball goes out of play, or a free-kick is awarded.</p> <p>We operationalized that a team had control of the ball when a player made two or more touches or was able to make a controlled pass/shot using his first touch.</p>
Gesture size	Small gesture	Use this when the nonverbal behaviour are small one-arm-movements, downwards close to the body.
Gesture size	Medium gesture	Use this when the nonverbal behaviour, through arm-movements, is clearly visible and easy to detect. Can be made with one arm to the side or up, and two arms downwards (lower than shoulders).
Gesture size	Large gesture	Use this when the nonverbal behaviour, through arm-movements is seen as both arms raised above the shoulders, or both arms extended to the side.
Gesture intensity	Low intensity	The nonverbal intensity equivalent of whispering / slow walking. Use this when the nonverbal behaviour, through arm-movements, are slight, slow movements of hands, or one or both arms.
Gesture intensity	Medium intensity	The nonverbal intensity equivalent of normal speaking / jogging. Use this when the nonverbal behaviour, through arm-movements, is visibly dynamic. Can be made with both one and two arms/hands.
Gesture intensity	High intensity	The nonverbal equivalent of screaming/sprinting. Use this when the nonverbal behaviour, through arm-movements is visibly dynamic with high speed.

### 3.7.2 Tactical demeanour

We defined Tactical demeanour as when football players are trying to communicate, usually with their teammates, to tactically help them and therefore their team get an advantage over the game and opponents.

*Table 2 Definition of the tactical variables used.*

Variable	Value	Definition
Asking for ball	General	The player indicates through arm-movements that they want the ball, but not specifically WHERE they want the ball. Typically, with both hands, possibly when on the other side of the pitch. "Look at the amount of space I have got to receive the ball".
Asking for ball	Specific	The player indicates through arm-movements that they want the ball and leaves clues as to WHERE they want it (into space, to his feet, to his body etc.). If unsure whether a player is asking for the ball or asking a teammate to do something with the ball - use "Act with ball"!
Directing teammates	Act with ball	The analysed player uses arm movement to suggest a course of action for the ball carrier. Typically, pass to the right back, clear the ball etc. If unsure whether a player is asking for the ball or asking teammate to do something with the ball - use this button!

Directing teammates	To position (A)	The analysed player uses arm movements to suggest to a teammate that they make a movement, either to receive the ball or to create space. Applies most often in attack, but can also happen early in the transition phase? Attacking purpose.
Directing teammates	To position (D)	This is a defensive gesture that can apply both in and out of possession. A player uses arm movement to suggest to teammate(s) that an opposition player or space needs to be covered.
Directing teammates	Lower intensity	<p>Press this button when the analysed player makes a hand gesture to encourage e.g., teammates or fans to lower intensity in the game. Typically lowering one or both hands towards the ground, once or repeatedly.</p> <p>This gesture also occurs in situations where the player is showing that they or another teammate is in control of the ball, i.e., indicating control (of the ball).</p> <p>If unsure whether the player is indicating “lower intensity” or “act with ball” – use act with ball!</p>
Tactical	Influence referee	<p>Any behaviour and arm-movement that is done to influence the referee. Often made proactively, before the referee blows the whistle to challenge for a desired outcome. Typical example is that a teammate is tackled, and the analysed player raises their arms to challenge the ref and indicate “Ref, that’s a foul”. Could also happen after a foul, as the player tries to avoid e.g., a booking.</p> <p>This button activates the “to referee” button, so you do not have to click both.</p>
Tactical	Tactical exchange	<p>When you see two players or more engaged in a dialogue and the analysed player AND teammate BOTH at any point uses hand or arm movements, this is defined as a tactical exchange.</p> <p>Typically, there is eye contact, and two-way communication. It is not an instruction but an exchange, an act of giving one thing and receiving another (especially of the same type or value) in return. E.g., the analysed player tells the left back to cover the right wing on the opposite team. Then the left back replies with an arm movement indicating that the centreback needs to cover that player. Press this button in addition to the “tactical behaviour” buttons.</p>

### 3.7.3 Emotional demeanour

We defined the emotional demeanour as the different emotions the players are knowingly or subconsciously conveying to either other players on the pitch, the team, staff, supporters or even themselves.

*Table 3 Definition of the emotional variables used.*

Variable	Value	Definition
Positive Emotional	Energization	Any arm-related behaviour where the analysed player tries to increase and/or activate energy or intensity levels in themselves, teammate(s) or fans. Will possibly occur after the goalkeeper saves a penalty, a team is awarded a penalty, a last-ditch sliding tackle, a teammate misses a shot etc. Press this button when you are certain you see an energizing gesture, but you are not able to define what triggered it.
Positive Emotional	Emotional validation	Emotional validation is typically gestures where the analysed player's behaviour indicates they try to recognize and/or acknowledge other players emotions. Press the big button when you are certain you see an emotional validation gesture, but you are not able to define what triggered it.  Think "raise one arm acknowledging a teammate for making a nice run or other effort, apologizing for bad pass, thumbs up etc."
Positive Emotional	Relief	Any arm-related behaviour where the analysed player signals that they are relieved by the outcome of an event. Relief relates to the feeling of reassurance and relaxation following release from anxiety or distress.
Other Emotional	Other	Any arm-related behaviour where the analysed player does something emotional that cannot be placed in any of the other categories.
Negative Emotional	Disappointment, frustration and anger	Any behaviour indicating that the analysed player is disappointed, frustrated, or angry. Disappointment relates to sadness or displeasure caused by the non-fulfilment of one's hopes or expectations. Frustration arises from the perceived resistance to the fulfilment of an individual's will or goal and is likely to increase when a will or goal is denied or blocked. Anger involves a strong uncomfortable and non-cooperative response to a perceived provocation, hurt or threat. The behaviour can look like this: both hands in the air, both hands to the face, hiding their face in their hands, screaming to the skies with hands flexed, hitting the ground, kicking the air/ goal posts etc. Press this big button when you are certain you see a disappointment, frustration and/or anger gesture, but you are not able to define what triggered it.

Triggers are under-categories in the emotional variables which you press when you know what situation that triggered the emotional NVB.

*Table 4 Definition of the trigger variables that are connected to the emotional variables.*

Trigger/value	Definition
Shot	Press this button if the emotional behaviour is triggered by a shot or a header.
Game restart	Press this button if the emotional behaviour is triggered by the game restarting. E.g., clapping, refocusing gestures after cards, penalties, free-kicks etc. or frustration gestures that the ball needs to get back into play faster.
A+	Press this button if the emotional behaviour is triggered by a successful attacking action. E.g., successful pass, successful dribble.
A-	Press this button if the emotional behaviour is triggered by an unsuccessful attacking action. E.g., unsuccessful pass, unsuccessful cross, being dispossessed.
A No Ball	Press this button if the emotional behaviour is triggered by an attacking action without the ball. E.g., a player making a run without receiving the ball, or the analysed player does not receive the ball. (NB. If a teammate chooses to pass to the analysed player, but misses, use “A-“ as the trigger.
D+	Press this button if the emotional behaviour is triggered by a successful defensive action. E.g., successful tackle, dispossessing the opponent.
D-	Press this button if the emotional behaviour is triggered by an unsuccessful defensive action. E.g., being dribbled past, unsuccessful tackle, losing a challenge in the air.
Referee	Press this button if the emotional behaviour is triggered by the referee’s decision.
NVB	The analysed player raises one arm, gives a thumbs up etc. acknowledging to a teammate that they have received their intended message.
Touch	Press this button in addition to the other emotional/tactical gestures when the analysed player initiates touching.

### **3.8 Ethics**

Ethical norms serves the goals of the research and apply to those who conduct scientific or scholarly research (Gajjar, 2013). There are considerable reasons for why it is necessary to comply with the ethical norms in research. First being, norms advocate the goals of the research such as truth, knowledge and the avoidance of error (Gajjar, 2013). Secondly, research often requires a lot of cooperation with different people in various institutions and

disciplines and the ethical standards advocate the values that are fundamental to collaborative work (e.g., accountability, fairness, mutual respect and first of all trust) (Gajjar, 2013).

This study has been approved by Norwegian Centre for Research Data (Norwegian: NSD) (see appendix). It has been approved by NSD by fulfilling the codes and policies for research ethics, as well as the five principles for research ethics (Gajjar, 2013). Informed consent from players and teams was not obtained. Data for this project consists of already existing video footage of publicly held football matches which the football clubs themselves and of course the media already scrutinises in detail as well as being broadcasted publicly. Obtaining consent from the players and clubs to study the already existing video footage would therefore seem unnecessary. Expecting to get consent from the players and teams would be unrealistic or rather impossible, since these players and teams play at the highest professional level in commercially the biggest football league in the world and probably gets hundreds if not thousands of inquires every week and will therefore most likely not even answer our inquiry. This is also in line with a published policy in leading Journal of Sports Sciences, which states that professional athletes must expect to undergo a number of tests and analyses as a part of their profession, and that this is omitted from normal requirements from obtaining consent (Winter & Maughan, 2009). Therefore, following NSDs recommendations, informed consent will not be obtained, and we have instead made the information about the project publicly available through a website informing about the project. Still, confidentiality has been secured by not making any of the personal information about the teams or players become identifiable or public.

### **3.9 Statistical analysis**

All the variables were analysed and registered in the statistical program IBM SPSS version 28.0.0.0 (190). For the statistical tests, both the timeline set of data (categorical data) and the matrix set of data (continuous data) were used. The variables used on the timeline set of data were “demeanour emotional/emotional NVB”, “emotional: disappointment, frustration and anger”, “emotional: energization”, “emotional: emotional validation”, “demeanour tactical/tactical NVB”, “home and away team”, “player position” and “game status”. The variables used on the matrix set of data were “total registrations”, “registration frequency”, “NVB frequency level”, “NVB frequency behind”, “NVB frequency ahead”, “emotional NVB” “emotional: energization”, “emotional: emotional validation”, “positive NVB”, “negative NVB”, “tactical NVB” “tactical: asking for ball”, “tactical: directing teammate(s)”

“tactical: influence referee”, “other: touch”, “end result” “home and away team” “player position”. “NVB frequency” was calculated manually by dividing the number of total registrations the players had with the amount of minutes they played. Likewise, “NVB frequency level”, “NVB frequency ahead” and “NVB frequency behind” was manually calculated by getting overall statistics from each game and the number of minutes each team was ahead, level or behind, then dividing the number of NVB registrations the players had in each of the different phases and dividing it by the number of minutes those phases lasted throughout the match.

First, to know what type of tests to conduct, a normality test was done on the selection of data. A Kolmogorov-Smirnov test was conducted on the variables, as the sample size was >50. The Kolmogorov-Smirnov test was conducted on the variables “total registrations”, “registration frequency”, “NVB frequency level”, “NVB frequency behind”, “NVB frequency ahead”, “demeanour emotional”, “demeanour tactical”, “tactical frequency”, “emotional frequency” and “asking for ball frequency” from the matrix set of data, since they were the continuous data used as outcome variables. The normality tests showed that the data for every one of those variables were not normally distributed, thus non-parametric tests, plus the parametric test, multivariate analysis of variance (MANOVA) tests were conducted on that set of data (Field, 2013; O'Donoghue, 2012). Although, the data is not normally distributed, mean (M) and standard deviation (SD) will also be used to measure the selections average and spread. Reasoning being that most of the variables being tested were turned into frequency measure, where mean and median (Mdn) had a very little difference. When the total amount of registrations is divided by how many minutes the players played, the data became a lot more normally distributed (although the Kolmogorov-Smirnov test still showed that the data was skewed, because of a few outliers). It would be easier to compare the findings with other studies and research articles with mean, as they used the mean (average value) as a measurement. Mean will often be referred to as the “average” value.

For the statistical analysis, different tests were conducted using both sets of data. The non-parametrical tests which were used for testing on the continuous (matrix) set of data were Kruskal-Wallis H test, Mann-Whitney U test and a multivariate analysis of variance (MANOVA) test. The Kruskal-Wallis H test compares groups containing independent scores (Field, 2013). This test was used to find out how the different player positions affected the players' NVB. For the Kruskal-Wallis H test the variables “player position” was used as the

predictor variable, while “registration frequency”, “tactical: asking for ball”, “tactical: directing teammate(s)” and “emotional NVB” was used as the outcome variables. The Mann-Whitney U test is the non-parametric version of the independent t-test and is therefore used when one is comparing the distribution in two conditions that contains scores from different entities (Field, 2013). The Mann-Whitney U test was used to find out if there was a difference in the player’s NVB when playing home or away. The Mann-Whitney test used “home and away team” as the predictor variable, while “registration frequency”, “tactical: asking for ball”, “tactical: directing teammate(s)”, “tactical: influence referee” and “emotional NVB” as the outcome variables. The parametric test MANOVA was conducted to examine the relationship between home and away teams and the teams that won, drew and lost, while not fully complying with the assumptions, because the research question requires to look at group differences with a range of variables together. As far as I know, there is not a non-parametric equivalent to the MANOVA test (Field, 2013). The MANOVA was performed with “NVB frequency level”, “NVB frequency ahead”, “NVB frequency behind”, “positive NVB” “negative NVB” “tactical: direct teammates”, “tactical: asking for ball” as outcome variables. “End result” and “home and away team” was the predictor variables. A significance level of 0.025 was used and the Bonferroni correction was employed to correct for multiple testing ( $p = 0.05/2 = 0.025$ ). To check how the data behaved when doing separate independent tests, the non-parametric Mann-Whitney U tests were conducted when using “home and away team” as the predictor variable and Kruskal-Wallis H tests were conducted when using “end result” as the predictor variable. This was to test the outcome variables with the predictor variables individually to see if using the parametric MANOVA test would give different results than the non-parametric test. The Mann-Whitney U and Kruskal-Wallis H tests had a significance level of  $p = 0.05$ .

The statistical tests which were conducted for testing on the categorical (timeline) set of data were a Pearson Chi-Square test and a loglinear analysis. The loglinear analysis was used to examine how the players emotional NVB changed when their team was ahead, level or ahead. In the loglinear analysis “home and away team” was used as the predictor variable, while “emotional NVB” and “game status” was used as the outcome variables. The loglinear analysis both K-way and Higher-Order Effects will be looked at as well as the significance level ( $p < 0.05$ ) of the partial association. The K-way and Higher-Order Effects table reveals whether removing one the main effects (the main effects being the variables tested) of the



different interactions will affect the fit of the model. The partial associations table breaks down the model into the specific components (Chi-Square test) and tells us which specific interactions that make a difference.

## 4 Results

In this section, the results are going to be divided by research question and presented thematically. Most of the research questions' results will start with a descriptive overview of the findings before showing to statistical tests.

### 4.1 What characterises the players' and teams' NVB in a football match?

#### 4.1.1 The different behaviours displayed in a football match

The players displayed 41845 NVBs in total, where 34025 of them were tactical behaviours and 7820 were emotional behaviours. Of the tactical NVBs, 13.1% were the players asking for the ball, 72.1% were players directing their teammates and 11.7% were players trying to influence the referee. The last 3.1% were tactical behaviours that were too indecipherable to know what kind of tactical behaviour it was. Of the NVBs where the players were directing their teammates, they most often asked their teammates to position themselves defensively 28.7% of the time. The players asked their teammates to act with the ball 21.4% of the time, to position themselves offensively 10.5%, and lastly to lower the intensity 5.6% of the time. The players conveyed on average 154.6 behaviours per game (SD = 110, N = 271). The players that played for 90+ minutes, had on average 197.7 NVB registrations (SD = 98.7, N = 177). The highest number of NVBs in a 90-minute match was 541.

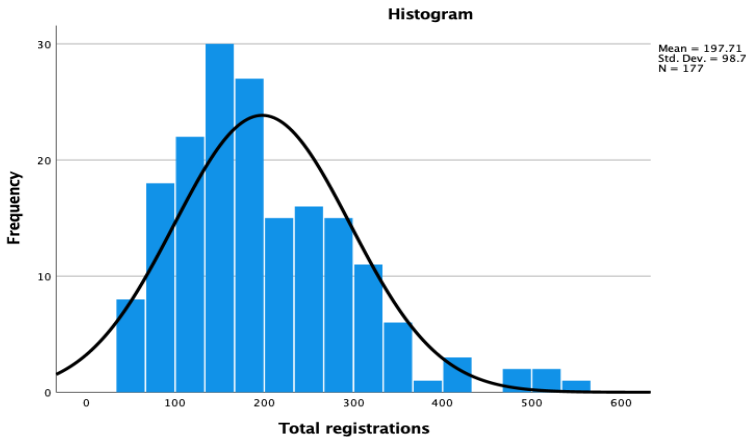


Figure 4 showing the number of NVBs of the players that played an entire football match.

The players in this study displayed on average 1.87 NVBs per minute (frequency) (SD = 0.99, N = 271). The player with the highest NVB frequency displayed 5.78 NVBs per minute and the player with the lowest NVB frequency displayed 0.27 NVBs per minute. 92.9% of the

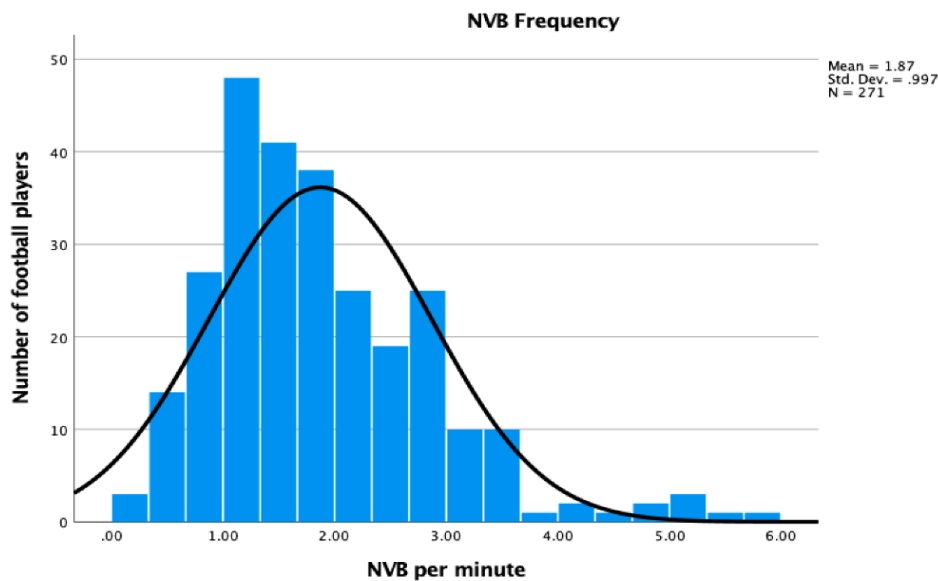


Figure 5 showing the NVB frequency (NVB behaviours per minute) for all players analysed during a football match.

gestures the players made were categorised as medium gestures, 1.6% were categorised as small gestures and 5.4% were categorised as large gestures. 97.7% of the gestures made had a medium intensity, 0.2% had a low intensity and 1.9% had a high intensity. Players displayed NVBs slightly more when their team was in possession (51%) than when their team was out of possession (49%).

Of the emotional NVBs, 37.1% were disappointment, frustration and anger, 36% were energization gestures, 20.1% were emotional validating gestures, 6.5% were categorised as other emotional NVBs and lastly 0.1% were showing relief. Meaning 56.1% of the emotions conveyed were perceived as positive, 37.1% as negative and 6.5% were perceived as other.

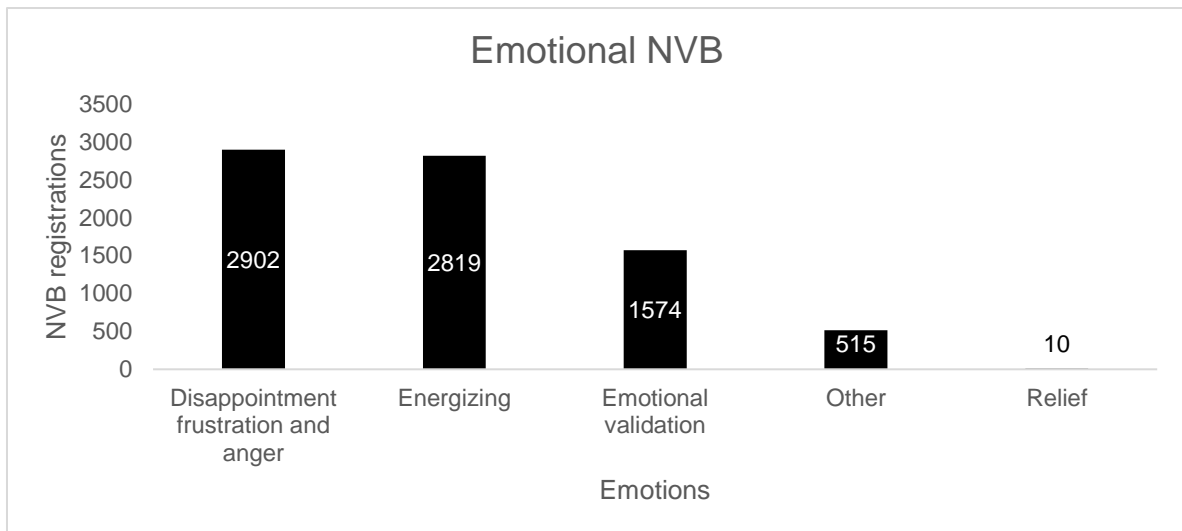


Figure 6 showing the distribution of the different emotional NVBs the players conveyed.

When it comes to the different emotional NVBs, 19.8% were triggered by unsuccessful attacking actions (A-), 16.1% were triggered by the game restarting, another 16% were triggered by decisions by the referee, 12.4% were reactions to a shot, another 12% were triggered by successful defensive actions (D+), 6.7% were reactions to an attacking action without the ball (A No Ball), 6.1% were triggered by unsuccessful defensive actions (D-), another 6% were triggered by successful attacking actions (A+), and lastly, 4.9% of the emotional NVBs were triggered by acknowledging to a teammate that the player had received the message (NVB).

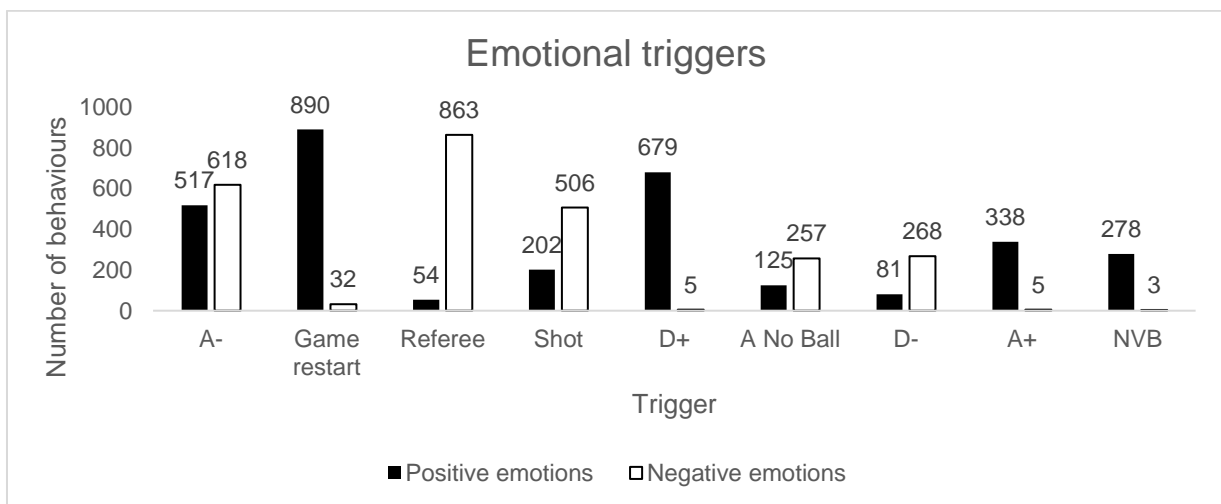


Figure 7 showing the distribution of the emotional triggers for the emotional NVBs.

### 4.1.2 Positions' characteristics

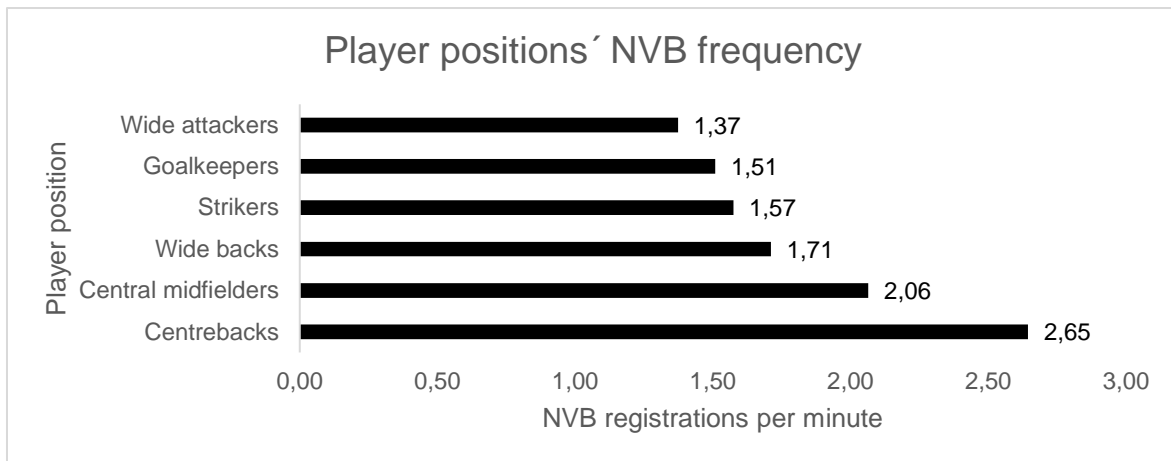
It could be clearly depicted which position the players were communicating nonverbally with 23321 times in total in 14 matches. Midfielders communicate the most to the other positions and centrebacks are the ones that the other positions communicate the most with. The goalkeepers communicate the least to the other positions and strikers are communicated with the least. Table 1 (page 55) provides the distribution of how much the positions communicate with each other.

*Table 5 How much the different positions communicate with each other nonverbally during a match on average.*

<b>Position</b>	<b>Goalkeeper</b>	<b>Centreback</b>	<b>Wide back</b>	<b>Central midfielder</b>	<b>Wide attacker</b>	<b>Striker</b>
<b>Goalkeeper</b>		27.2	12.4	8	2	2.1
<b>Centreback</b>	13.8	36.8	36.8	33	7.9	4.8
<b>Wide back</b>	8.7	27.2	4.8	25.9	14.8	5.1
<b>Central midfielder</b>	8.7	23.9	22.9	19.1	15.6	8.7
<b>Wide attacker</b>	3.9	7.2	12.1	16	3.3	5.4
<b>Striker</b>	7.6	10.7	15.6	20.8	12.2	4.8

*Note 1 Row: with whom the player communicates with. Column: who communicates with the player. The goalkeeper square is blank, because a team only has one on the pitch at the time, therefore a goalkeeper cannot communicate to another goalkeeper*

When it comes to the different positions, the goalkeepers have the highest percentage of large gestures (6.8% of their gestures), while the strikers have the highest percentage of small gestures (2.8% of their gestures). The NVBs vary quite much from position to position. Goalkeepers (N = 20) had on average 148 NVB registrations, centrebacks (N = 50) had on average the highest NVB expressions with 241 NVBs per player, wide backs (N = 43) had a NVB average of 159, central midfielders (N = 70) had 166 NVBs on average per player, wide attackers had the lowest NVB average with 78 NVB expressions per player and lastly, the strikers had on average 126 NVBs per player during a match.

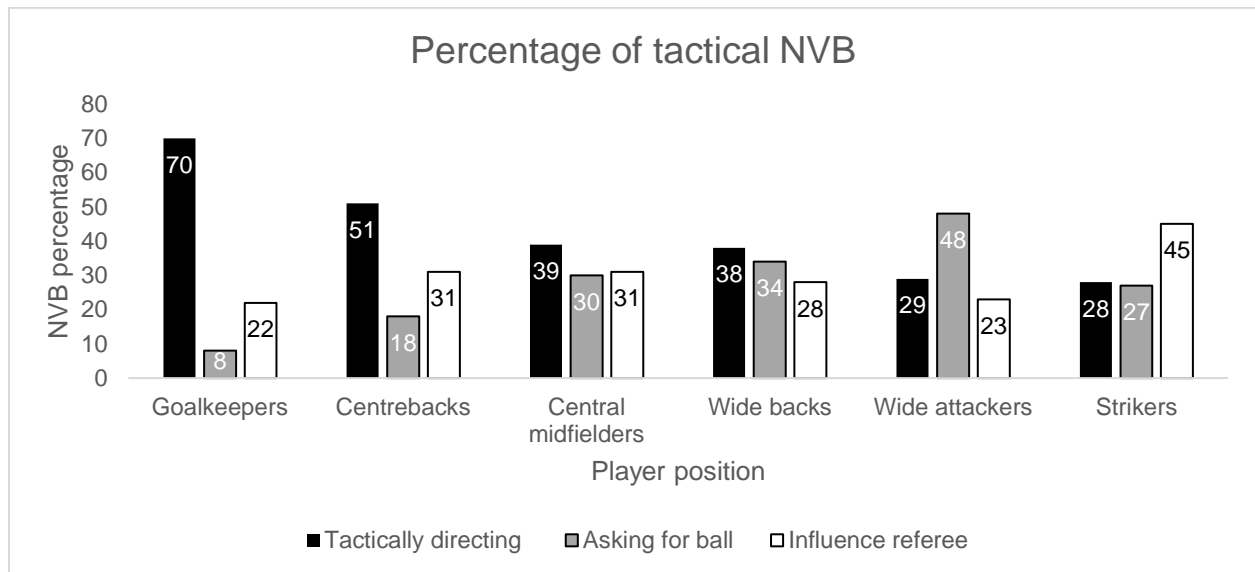


*Figure 8 showing the different positions' NVB average per minute.*

To examine whether there was a significant difference between the positions' NVB frequency a Kruskal-Wallis H test was performed (figure 7). The results showed that the NVB frequency was significantly affected by what position the players had,  $H(5) = 52.22$ ,  $p < 0.001$ . Pairwise comparisons revealed that there was a significant difference in NVB frequency between central midfielders compared to goalkeepers ( $p = 0.006$ ,  $r = 0.32$ ), wide attackers ( $p < 0.001$ ,  $r = 0.37$ ), strikers ( $p < 0.019$ ,  $r = 0.23$ ), wide backs ( $p = 0.029$ ,  $r = -0.20$ ) and centrebacks ( $p = 0.009$ ,  $r = 0.24$ ). There was also a significant difference in NVB frequency between centrebacks compared to goalkeepers ( $p < 0.001$ ,  $r = 0.53$ ), wide attackers ( $p < 0.001$ ,  $r = 0.62$ ), strikers ( $p < 0.001$ ,  $r = 0.48$ ) as well as wide backs ( $p < 0.001$ ,  $r = 0,45$ ).

When communicating tactically, the goalkeepers, centrebacks, central midfielders and wide backs use most of their tactical NVB to direct their teammates. The wide attackers ask for the

ball the most and the strikers try to influence the referee the most. Figure 9 (page 53) shows all of the positions' distribution.



*Figure 9 showing the percentage of the tactical NVB to the different positions.*

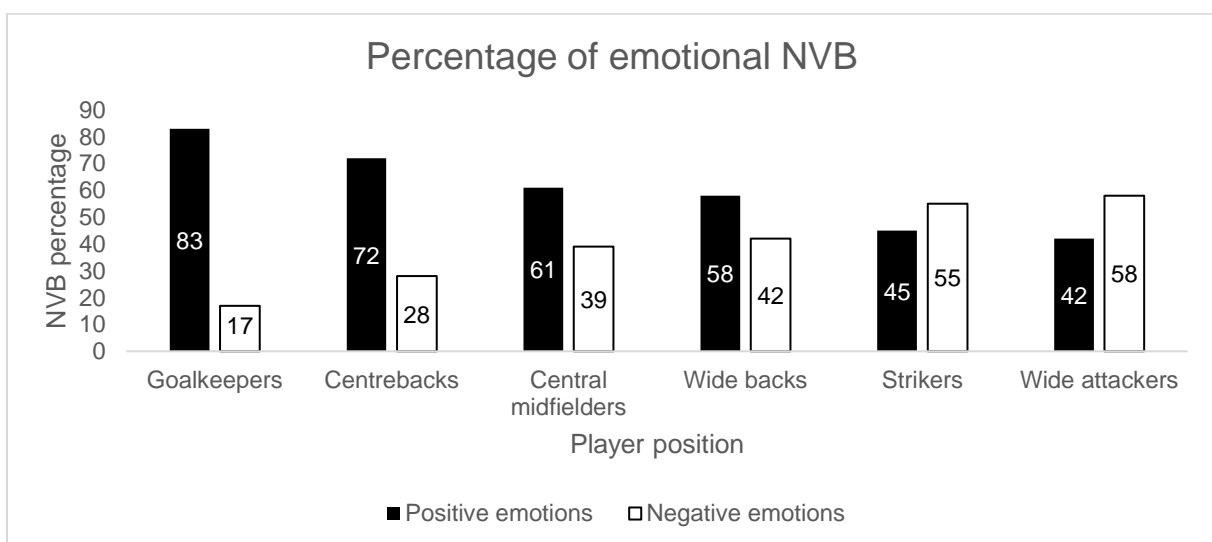
Three Kruskal-Wallis H tests were conducted to look at tactically directing and asking for the ball compared to player positions. Results from the first Kruskal-Wallis H test showed that players tactically directing their teammates were significantly affected by what position they played,  $H(5) = 82.95$ ,  $p < 0.001$ . Pairwise comparisons showed a significant difference between centrebacks compared to wide attackers ( $p = 0.000$ ,  $r = 0.85$ ), strikers ( $p < 0.001$ ,  $r = 0.54$ ), central midfielders ( $p < 0.001$ ,  $r = 0.37$ ) and wide backs ( $p < 0.001$ ,  $r = 0.38$ ). Further, there was a significant difference between wide attackers compared to strikers ( $p = 0.006$ ,  $r = 0.30$ ), central midfielders ( $p < 0.001$ ,  $r = 0.47$ ), wide backs ( $p < 0.001$ ,  $r = 0.47$ ) and goalkeepers ( $p < 0.001$ ,  $r = -0.56$ ). The goalkeepers and strikers had a significant difference as well ( $p = 0.021$ ,  $r = -0.32$ ).

The results on the second Kruskal-Wallis H test revealed that which position the players played significantly affected how much they asked for the ball,  $H(5) = 43.57$ ,  $p < 0.001$ . Pairwise comparisons show there was a significant difference between goalkeepers compared to centrebacks ( $p < 0.001$ ,  $r = 0.43$ ), wide attackers ( $p < 0.001$ ,  $r = 0.50$ ), central midfielders ( $p < 0.001$ ,  $r = 0.52$ ), wide backs ( $p < 0.001$ ,  $r = 0.72$ ) and strikers ( $p < 0.001$ ,  $r = 0.79$ ). Additionally, there was a significant difference between wide attackers compared to wide backs ( $p = 0.041$ ,  $r = 0.21$ ) and strikers ( $p = 0.020$ ,  $r = 0.25$ ) as well as there was a significant

difference between centrebacks compared to wide backs ( $p = 0.004$ ,  $r = -0.30$ ) and strikers ( $p = 0.002$ ,  $r = -0.34$ ).

The results from the third Kruskal-Wallis H test revealed that which position the players played significantly affected how much they tried to influence the referee,  $H(5) = 23.86$ ,  $p < 0.001$ . Pairwise comparisons revealed there was a significant difference in influencing the referee between wide attackers and strikers ( $p = 0.014$ ,  $r = 2.46$ ), central midfielders ( $p = 0.002$ ,  $r = 3.16$ ), wide backs ( $p < 0.001$ ,  $r = 3.40$ ) and centrebacks ( $p < 0.001$ ,  $r = 4.03$ ). There was also a significant difference between goalkeepers and central midfielders ( $p = 0.036$ ,  $r = 2.10$ ), wide backs ( $p = 0.016$ ,  $r = 2.42$ ) and centrebacks ( $p = 0.005$ ,  $r = 2.83$ ).

Of all the positions, the goalkeepers have the highest percentage of positive emotional NVB with 83%, while the wide attackers having the highest percentage of negative emotional NVB being negative with 58%. Figure 10 (page 54) illustrates all of the positions' emotional NVB.



*Figure 10 showing what percentage of positive and negative emotional NVB the different positions convey.*

#### **4.1.3 Home and away teams' characteristics**

The players in the home teams had a NVB average of 157 behaviours ( $SD = 119$ ,  $N = 150$ ) and their NVB frequency was at 1.9 on average ( $SD = 1.1$ ). The away teams had 151 NVBs on average ( $SD = 98$ ,  $N = 121$ ), while their NVB frequency was at 1.9 on average ( $SD = 0.9$ ). The players in the home team asked for the ball on average 13.8 times ( $SD = 13.7$ ) during a game, directed their teammates 77.7 times ( $SD = 74.2$ ) on average and tried to influence the referee 11.4 times ( $SD = 13.8$ ) on average during the game. The players in the away teams asked for the ball on average 19.8 times, ( $SD = 20.2$ ) during a game, directed their teammates

75.6 times (SD = 104.4) on average and tried to influence the referee 12.8 times (SD = 11.7) on average.

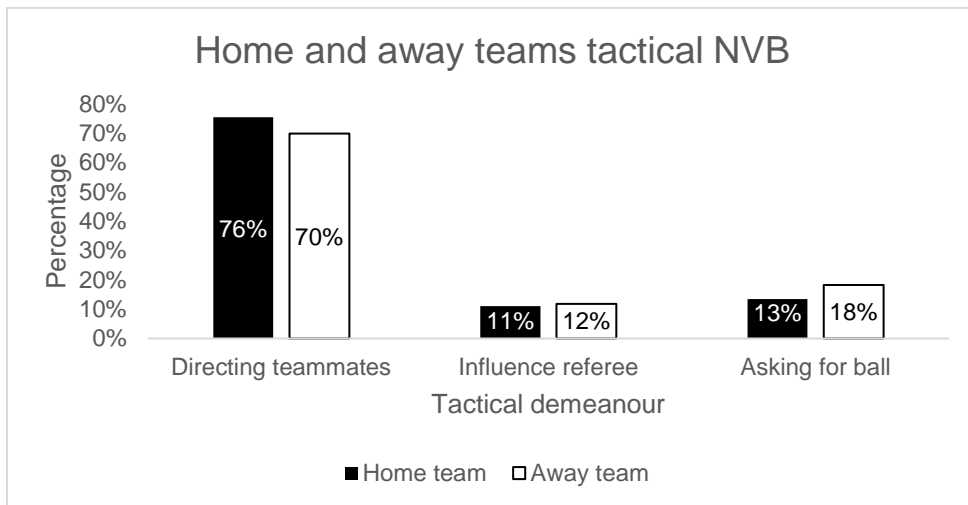


Figure 11 showing the distribution of the home teams' and away teams' players tactical NVB.

A Mann-Whitney U test was conducted to examine the difference in tactical NVB such as directing their teammates, influencing the referee as well as examining the difference in the players asking for the ball. The results showed that players in the away team asked for the ball (Mdn = 14) significantly more than the home teams' players (Mdn = 9),  $U = 10657.50$ ,  $z = 2.47$ ,  $p = 0.014$ ,  $r = 0.15$ . The other results for the Mann-Whitney U test showed that the players on the away team (Mdn = 9) try to influence the referee significantly more than the home teams' players (Mdn = 7.5),  $U = 10357$ ,  $z = 2.01$ ,  $p = 0.045$ ,  $r = 0.12$ . On the other hand, there was no significant difference between the players in the home (Mdn = 53) and away team (Mdn = 53), when it came to directing their teammates,  $U = 8906$ ,  $z = -0.26$ ,  $p = 0.792$ ,  $r = -0.02$ .

The players in the home team had both a higher positive emotional NVB average with 17.79 behaviours during a match (Mdn = 11, IQR = 16), as well as a higher negative emotional NVB average with 11.29 behaviours on average during a match (Mdn = 10, IQR = 11.50). Whereas the players in the away team had an average of 14.25 positive emotional NVBs (Mdn = 13, IQR = 21.51) and on average 9.99 negative emotional NVBs during a match (Mdn = 8, IQR = 10.50). Figure 10 (page 61) shows the emotional triggers to the teams.



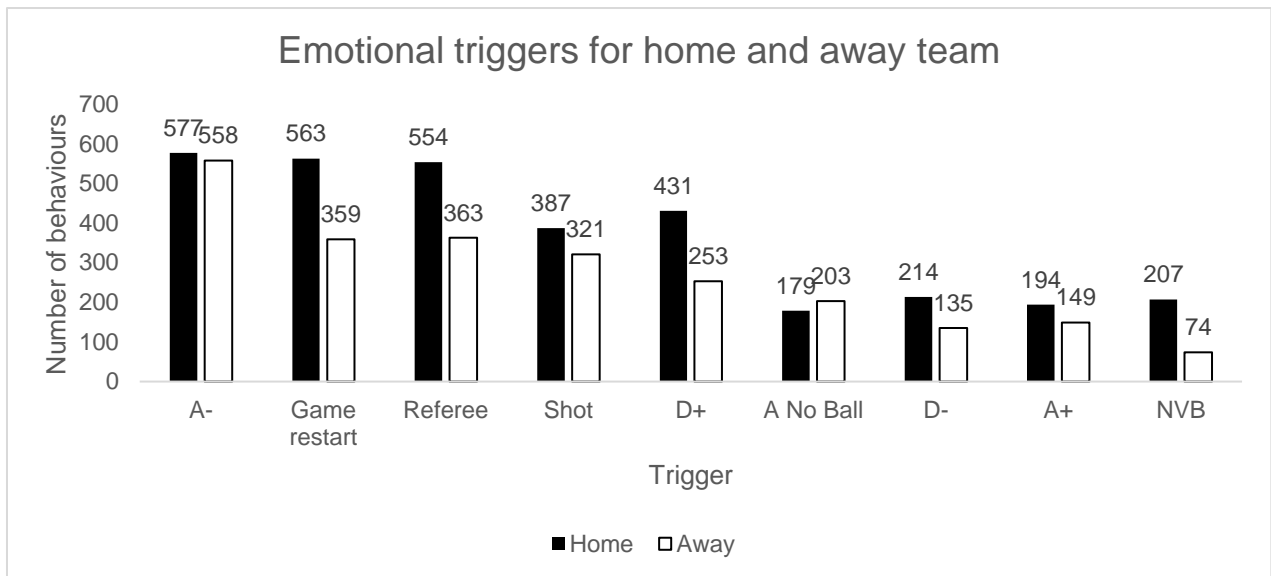
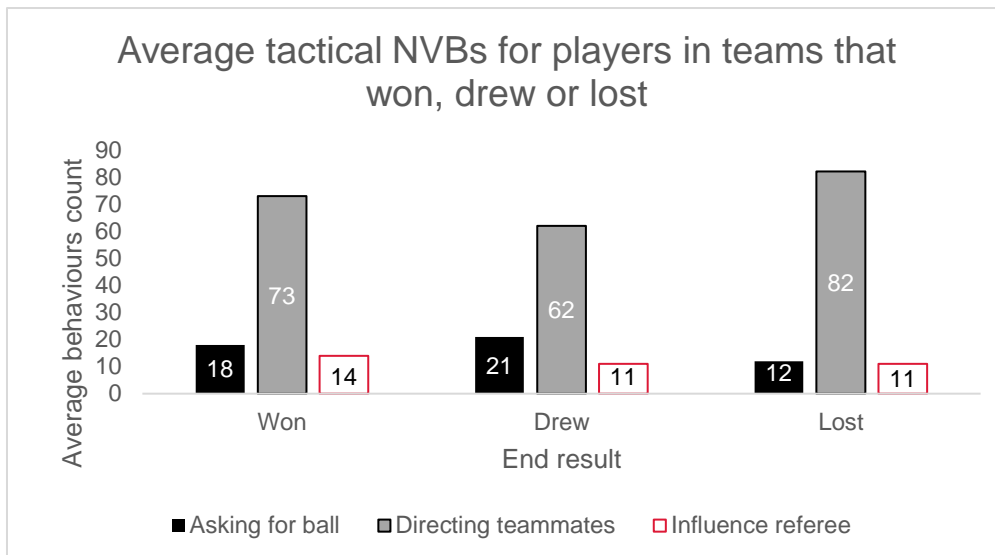


Figure 12 showing how many registrations of the different emotional triggers that are represented by the home and away teams.

To test the difference between emotional NVB in the home and away teams, another MANOVA test was performed. Using Pillai's Trace, whether the players played home or away did not have a significant effect on the number of positive or negative emotional NVBs,  $V = 0.01$ ,  $F(2, 268) = 1.93$ ,  $p = 0.15$ .

#### 4.1.4 What characterises the teams that won, drew or lost?

The players in the teams that won had a NVB frequency average of 2.0 (Mdn = 1.7, IQR = 1.5) and the players in the teams that lost had a NVB frequency average of 1.8 (Mdn = 1.5, IQR = 1.2) and the players in the teams that drew had a NVB frequency of 1.9 on average (Mdn = 1.7, IQR = 1.2). The players in the teams that won initiated touching on average 4.9 times (Mdn = 3.0, IQR = 5) during a match. The players in the teams that drew initiated touching on average 4.25 times (Mdn = 3.0, IQR = 5) during a match and the players in the teams that lost initiated touching on average 3.24 times (Mdn = 2, IQR = 3) during a match. Figure 11 (page 62) shows the teams' distribution of tactical NVB.



*Figure 13 showing how much the player on average asks for the ball, directs their teammates and tries to influence the referee when they are playing in a winning, drawing or losing team.*

A Kruskal-Wallis H test was conducted to examine whether there was a significant difference between the teams' tactical NVB. Results showed that there was no significant difference in directing teammates or influencing the referee. However, there was a significant difference between the teams and asking for the ball,  $H(2) = 10.41$ ,  $p = 0.005$ . Pairwise comparisons showed that there was a significant difference between losing teams and drawing teams ( $p = 0.002$ ,  $r = 3.16$ ). There was no significant difference between the losing and winning teams nor between the winning and drawing teams.

When examining the emotional NVB of the teams, the players in the teams that won had a positive emotional NVB average of 17 registrations during a match (Mdn = 11, IQR = 13), the players in the teams that drew had an average of 18 positive emotional NVB registrations during a match (Mdn = 12.5, IQR = 22.57), while the players from the teams that lost had a positive emotional NVB average of 14 registrations (Mdn = 11, IQR = 17).

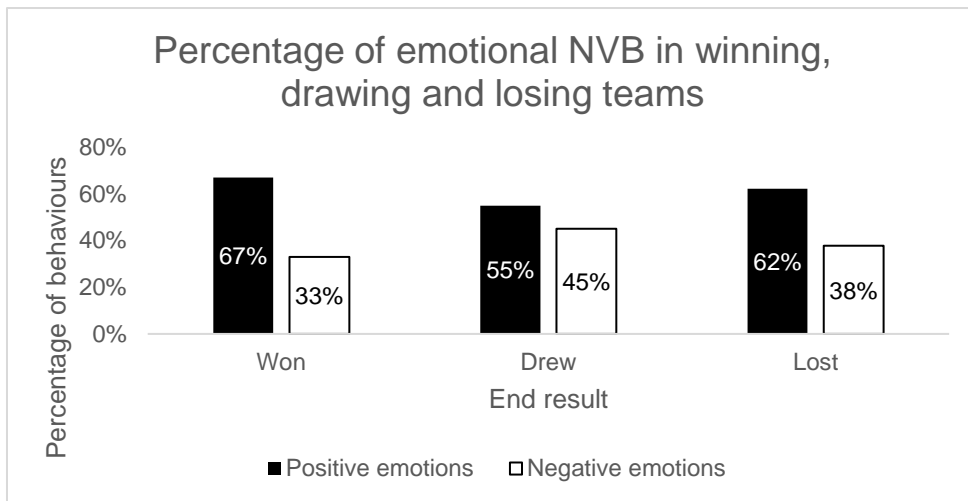


Figure 14 showing the percentages of emotional NVB to the winning, drawing and losing teams' players.

The players in the teams that won had a negative emotional NVB average of 9 registrations during a match (Mdn = 7, IQR = 10), the players from the teams that drew had an average of 15 registrations (Mdn = 8, IQR = 11) and the players in the teams that lost had a negative emotional NVB average of 13 registrations (Mdn = 10.54, IQR = 14).

Table 6 showing the distribution of the emotional triggers to the teams that won, drew or lost.

Teams	A-	Game restart	Referee	Shot	D+	A No Ball	D-	A+	NVB
Won	19%	13%	11%	17%	15%	9%	5%	7%	5%
Drew	20%	18%	18%	10%	11%	7%	7%	7%	4%
Lost	21%	15%	17%	12%	11%	6%	5%	5%	7%

To test whether there was a significant difference between the teams and their emotional NVB, a MANOVA test was conducted. Using Pillai's Trace, there was no significant difference on a players emotional NVB whether the player was on a team than won, drew or lost,  $V = 0.14$ ,  $F(4, 34) = 0.63$ ,  $p = 0.64$ .

## 4.2 How does the NVB change during a match?

The players NVB frequency changed depending on the score. Figure 12 (page 61) shows how the NVB frequency changes as the score changes.

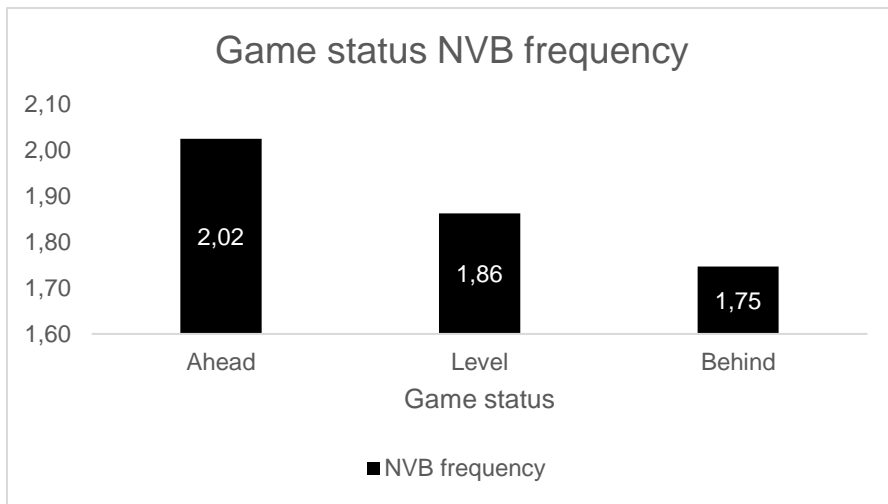


Figure 15 A player's NVB frequency when their team is in the lead, behind or level with the opposition.

Furthermore, this study wanted to examine the teams' NVB frequency and look at the difference between the teams that won, drew and lost, as well as the away and home teams. Figure 13 (page 62) shows the NVB frequency to the teams that won, drew or lost changes depending on score.

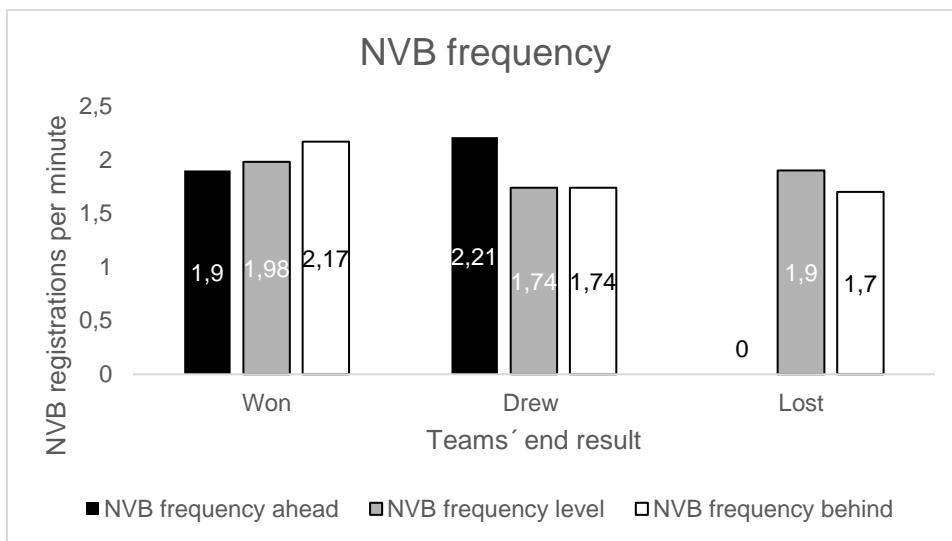


Figure 16 NVB frequency average to the players when ahead, level or behind in the teams that won, drew and lost their match.

A MANOVA test was performed to test the difference between the teams' NVB frequency when level, ahead or behind. Using Pillai's Trace, there was a significant difference in NVB frequency when ahead, level or behind for players who either was on a team than won, drew or lost  $V = 0.45$ ,  $F(6, 534) = 25.44$ ,  $p < 0.001$ . Separate univariate tests on "NVB frequency level", "NVB frequency behind" and "NVB frequency ahead" revealed that what team the

players played on (team that won, drew or lost) had a significant effect on the NVB frequency when behind,  $F(2, 268) = 32.74, p < 0.001$  and for NVB frequency when ahead,  $F(2, 268) = 72.47, p < 0.001$ . There was not however a significant difference for NVB frequency when level,  $F(2, 268) = 0.10, p = 0.907$ .

Figure 14 (page 63) shows the home and away teams' NVB frequency compared to score.

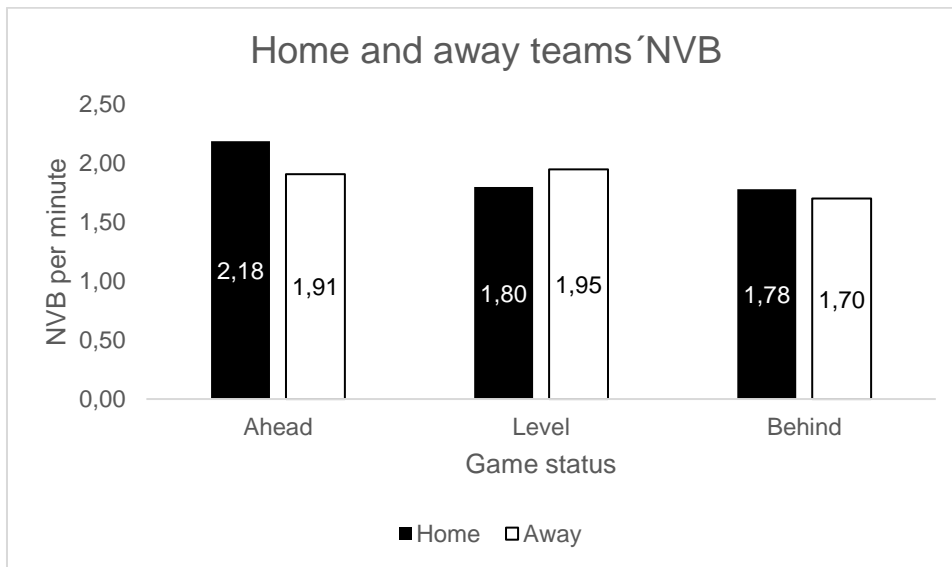


Figure 17 showing the home and away teams' NVB frequency compared to game score.

To examine whether there was a significant difference between the home and away teams' NVB frequency compared to score, a Mann-Whitney U test was conducted. Results showed that there was a significant difference in NVB frequency between the players in the away team (Mdn = 1.56) and home team (Mdn = 1.67) when their team was behind,  $U = 7771.50, z = -2.10, p = 0.035, r = -0.13$ . There was also a significant difference between the away teams (Mdn = 1.88) and home teams (Mdn = 1.81) when their team was ahead,  $U = 10774, z = 2.99, p = 0.003, r = 0.18$ . However, there was not a significant difference between the players in the home team (Mdn = 1.53) and away teams (Mdn = 1.75) when the game was level,  $U = 10112, z = 1.61, p = 0.106, r = 0.09$ .

#### 4.2.1 How the tactical NVB change compared to score

Next, this study examined the relationship between the teams' tactical NVB when compared to score. Figure 15 (page 64) shows the home results for the home team and figure 16 (page 64) shows the away teams' results.

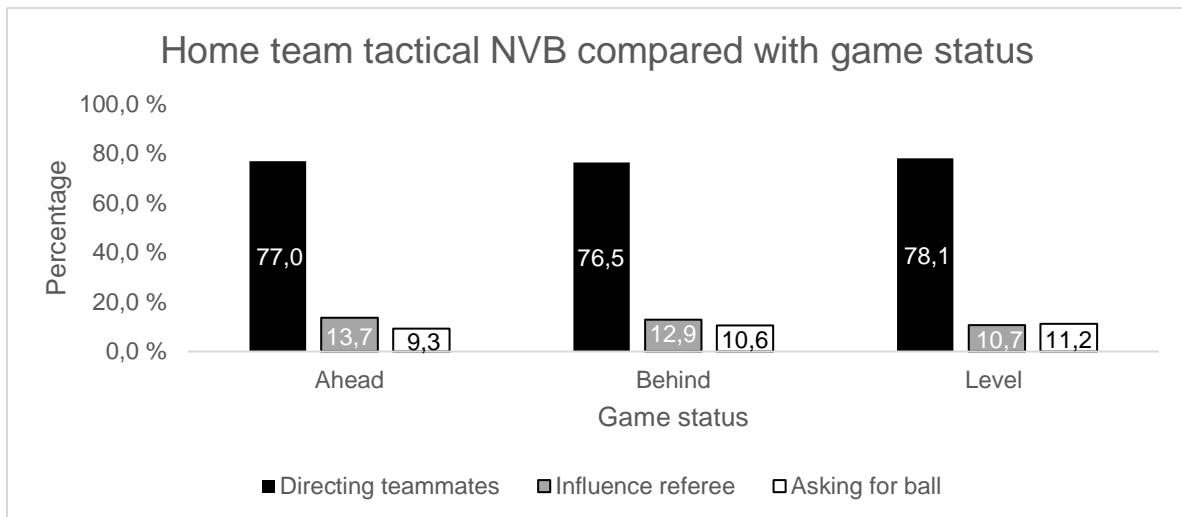


Figure 18 The home teams' tactical NVB compared to game score.

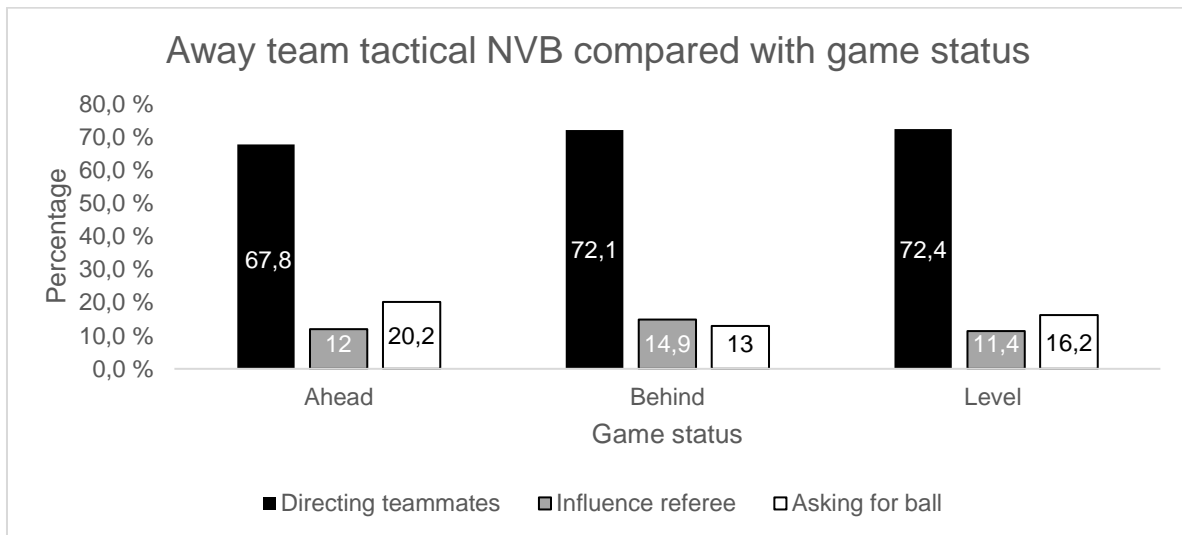


Figure 19 The away teams' tactical NVB compared to score.

A MANOVA test was conducted to examine whether being in the home team or away team affected the players' tactical NVB when their team was ahead, level or behind. Using Pillai's Trace, there was a significant difference between the home teams' and away teams' players asking for the ball when ahead,  $V = 0.07$ ,  $F(2, 107) = 3.9$ ,  $p < 0.023$  and when level,  $V = 0.04$ ,  $F(2, 242) = 5.25$ ,  $p = 0.006$ . However, there was no significant difference between the home teams' or away teams' players asking for the ball when they were behind,  $V = 0.03$ ,  $F(2, 158) = 2.1$ ,  $p = 0.126$ . Using Pillai's Trace, there was a significant difference between the home and away teams' players directing their teammates when ahead,  $V = 0.03$ ,  $F(2, 268) = 3.94$ ,  $p = 0.021$ , and when level,  $V = 0.04$ ,  $F(2, 268) = 6.23$ ,  $p = 0.002$ . Surprisingly, there was no significant difference in directing teammates when the teams were behind,  $V = 0.01$ ,  $F(2, 268)$

= 1.95,  $p = 0.145$ . Using Pillai's Trace, there was no significant difference in influencing the referee between the home and away teams' players when they were ahead,  $V = 0.02$ ,  $F(2, 268) = 2.04$ ,  $p = 0.132$ , when they were level,  $V = 0.00$ ,  $F(2, 268) = 0.44$ ,  $p = 0.643$ , and when the teams were behind,  $V = 0.02$ ,  $F(2, 268) = 2.84$ ,  $p = 0.060$ .

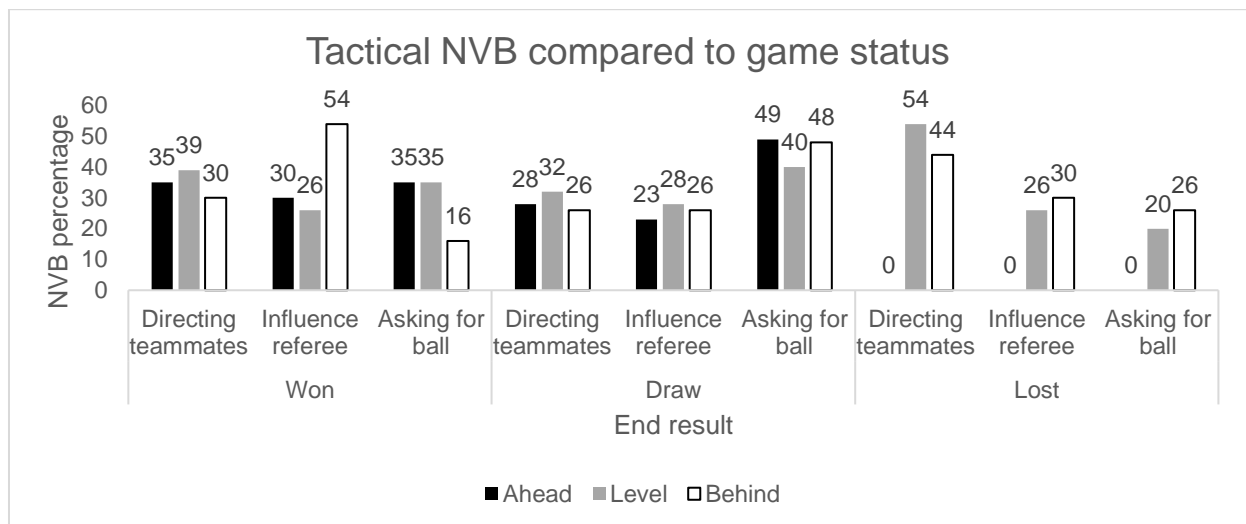


Figure 20 showing the percentage of tactical NVB to the teams that won, drew or lost when they are ahead, level or behind.

To examine the difference between the winning, drawing and losing teams' tactical NVB when level, ahead or behind, a MANOVA test was performed. Using Pillai's Trace, there was a significant difference in asking for the ball between the players that played on a team that won, drew or lost when ahead,  $V = 0.35$ ,  $F(4, 536) = 28.79$ ,  $p < 0.001$ , when level,  $V = 0.50$ ,  $F(4, 536) = 3.42$ ,  $p = 0.009$  and when behind,  $V = 0.24$ ,  $F(4, 536) = 18.31$ ,  $p < 0.001$ . Using Pillai's Trace there was a significant difference in directing teammates when the teams were level,  $V = 0.08$ ,  $F(4, 536) = 5.69$ ,  $p < 0.001$  and when the teams were behind,  $V = 0.25$ ,  $F(4, 536) = 19.23$ ,  $p < 0.001$ . Lastly, using Pillai's trace, there was also a significant difference between the winning, drawing and losing teams' players trying to influence the referee when behind,  $V = 0.23$ ,  $F(4, 536) = 17.72$ ,  $p < 0.001$ .

#### 4.2.2 How the emotional NVB change compared to score

The home teams and away teams players' percentage of emotional NVB when being ahead, level or behind is illustrated in table 3 (page 66).

*Table 7 showing the teams' emotional NVB percentage when compared to score.*

Game status	Emotional demeanour	Home team	Away team
<b>Ahead</b>	Positive emotions	70.7%	62.8%
	Negative emotions	29.3%	37.2%
<b>Level</b>	Positive emotions	62.6%	57.4%
	Negative emotions	37.4%	42.6%
<b>Behind</b>	Positive emotions	49.9%	57.5%
	Negative emotions	50.1%	42.5%

A three-way loglinear analysis was conducted to examine the relationship between teams, emotional NVB and score. The analysis produced a model that retained all effects. The likelihood ratio of this model was  $\chi^2(0) = 0$ ,  $p = 1$ , meaning that the highest order interaction (team x game status x emotional NVB) was significant with  $\chi^2(6) = 22.32$ ,  $p < 0,001$ . Separate chi-square test on “emotional NVB” and “game status” for home teams and away teams were conducted to break down this effect. For the home team there was a significant association between what the score was and what emotional NVB they were conveying,  $\chi^2(2) = 63.03$ ,  $p < 0,001$  and for the away team it was  $\chi^2(2) = 6.55$ ,  $p = 0.38$ . The odds ratio indicated that for the away teams, the odds for conveying positive emotions were 1.25 times higher when being ahead than when they were behind, However, for the home team the odds of conveying positive emotions were 2.44 times higher when they were ahead than when they were behind. The odds of an away team to convey negative emotional NVB was 0.80 times higher when being behind than when they were ahead. The odds for a home team to convey negative emotional NVB was 2.43 times higher when they were behind than when they were ahead.

Table 4 (page 67) provides the percentage of positive and negative NVB the teams that won, drew and lost had while they were either ahead, level or behind.



*Table 8 shows the different percentage of emotional NVB to the teams that won, drew or lost compared to score.*

<b>Game status</b>	<b>Emotional demeanour</b>	<b>Won</b>	<b>Drew</b>	<b>Lost</b>
<b>Ahead</b>	Positive emotions	68.7%	54%	0%
	Negative emotions	31.3%	46%	0%
<b>Level</b>	Positive emotions	64.7%	55.9%	68.6%
	Negative emotions	35.3%	44.1%	31.4%
<b>Behind</b>	Positive emotions	43.6%	43.5%	56.1%
	Negative emotions	56.4%	56.5%	43.9%

*Note II The teams that lost were never ahead in the match, which is why the table shows 0% in that section.*

A MANOVA test was conducted to examine the difference in emotional NVB when ahead, behind or drawing between teams that won, drew and lost. Using Pillai's Trace, there was no significant difference between the players and whether their teams won or drew and their positive emotional NVB when ahead,  $V = 0.38$ ,  $F(2, 107) = 2.14$ ,  $p = 0.123$ . However, using Pillai's Trace, there was a significant difference between the players and whether their team won, drew or lost and their positive emotional NVB when being behind,  $V = 0.84$ ,  $F(4, 316) = 3.47$ ,  $p = 0.009$ . When examining negative emotional NVB, using Pillai's Trace, there was a significant difference between the players and whether their teams won, drew or lost and their negative emotional NVB when behind,  $V = 0.17$ ,  $F(4, 316) = 7.14$ ,  $p < 0.001$ . Additionally, using Pillai's Trace, there was also a significant difference between the players and whether their teams won or drew and their negative emotional NVB when ahead,  $V = 0.07$ ,  $F(2, 107) = 4.11$ ,  $p = 0.019$ . Using Pillai's Trace, there was also a significant difference between the players and whether their teams won, drew or lost and their negative emotional NVB when being level,  $V = 0.15$ ,  $F(4, 484) = 9.85$ ,  $p < 0.001$ .

## **5 Discussion**

The main aim of this study was to describe and understand how football players in the Premier League use their nonverbal behaviour (NVB) to communicate with others and hopefully understand the NVBs connection to the players' psychological and emotional state. Further, the aim of this study was twofold: 1) Find out what characterises a player's and a football team's tactical and emotional NVB in a football match? 2) Find out if the team the player plays for affects their NVB and if their tactical and emotional NVB change as the score

changes during a match? This study builds on previous research and articles on NVB in a sporting context (Bijlstra et al., 2020; Furley, 2021b; Furley et al., 2019; Furley & Memmert, 2021; Furley & Schweizer, 2014a, 2014b; Leitner & Richlan, 2021). Furthermore, it provides a new way of examining NVB as it is an observational study where football players are observed and analysed in a real life setting. Therefore, this study tries to provide an overview of how football players behave nonverbally and what characterises their tactical and emotional NVB. Unlike studies where the thin-sliced paradigm is used (Furley et al., 2019; Furley & Memmert, 2021; Furley & Schweizer, 2014b, 2015), this study is the first to look at NVB by observing players for an entire football match, while trying to categorise the entire body language repertoire football players have at the same time. The discussion is sectioned by the research questions and will further look into possible implications to practice, strengths, limitations and future research.

## **5.1 What characterises a player's tactical and emotional NVB in a football match?**

Out of the 41845 registrations of NVBs the players displayed, 34025 of them were tactical behaviours and 7820 were emotional behaviours. Meaning 81% of the time a player displays NVBs, it is tactically minded. The reasoning for the tactical NVBs being a much higher percentage can be due to several reasons. One of the reasons can be that the game is being played at such a high pace, and it is therefore it is more vital to communicate tactically than emotionally. In football, players have often just seconds to make decisions, and the game of football is becoming increasingly more tactically advanced as the years go by (Williams & Jackson, 2019). Therefore, players have to do what they can to help both themselves and their teammates make the correct decisions. Additionally, players are most likely often told by the coach to communicate more with each other. However, in a match where there are tens of thousands of cheering fans in the stands, it will be incredibly hard to communicate vocally. Therefore, NVB and their tactical NVB becomes a bigger part of the players behaviour and form of communication.

A reason why the emotional NVBs are at such a lower percentage could be that players do not have that much time to show emotions during play, because the game is being played at such a high pace. Players have to be focused on what is happening right now to perform. Emotions are often displayed because of something that happened earlier (Crivelli & Fridlund, 2019;

Furley & Schweizer, 2015), and in a fast pace league such as the Premier League, most of the players would not have time to display that much emotions while the ball is in play. Most of the emotional registrations were reactions after the ball was out of play, showing that players mostly show emotional NVBs when they do not have to be as focused on what is happening instantly. Another reason could be that professional football players cannot be too emotional in a match where there is considerably much at stake. Players need to stay calm and collected in the heat of the moment, so the emotions do not take over and affect their judgement. This does not mean that football players are not emotional at all, as the results show. It might just mean that they constrain their emotions more to manage to stay focused and make the best decisions.

Of the tactical NVBs, 13.1% were the players asking for the ball, 72.1% were players directing their teammates and 11.7% were players trying to influence the referee. The results show that players mostly try to help and direct their teammates. This could indicate that players feel it is most important to help their teammates as much as possible to make decisions to have a higher chance in winning the game. The importance of being able to maintain a high frequency of communication between teammates is recognised as an imperative part for any sports team to achieve higher performance and is one of the reasons why communication has been identified by researchers as perhaps the most essential part of team interaction in sport (LeCouteur & Feo, 2011, pp. 124-125). This is probably the reason for why most of the tactical NVBs are players communicating tactically to their teammates on what to do. When it is imperative for football players to have the ability to perceive and interpret their teammates' signals to be able to read the game and build their actions, directing your teammates is an immense part of making it easier for your teammate reading the game (Williams & Jackson, 2019).

Regarding the findings of the emotional NVBs, 36% were energization gestures, 20.2% were emotional validating gestures, 0.1% were showing relief nonverbally, 37.2% were disappointment, frustration and anger and lastly 6.5% were categorised as other emotional NVBs. Meaning, approximately 56.3% of the emotions displayed were looked at as positive and 37.2% were looked at as negative. According to Fridlund (1994) behavioural ecology theory, NVB should be recognised as an instrument for communicating to others their social motives and behavioural intentions, rather than just using it as an instrument to express their feelings or current subjective experience. The results also coincide with DePaulo (1992) take

on self-presentation which states there are more circumstances where people will try to convey emotions that are more positive than how they really feel, rather than circumstances where they try to convey evaluations that are more negative than what they really feel to get the outcome they desire. This could tell us that a reason why the players are more likely to display the positive emotions than the negative emotions when reacting to their own or their teammates actions is that their motives are for them, their teammates and their team to perform. Therefore, they know that if they only express negativity and how they are feeling when bad things happen, it will most likely have a detrimental effect on the team's performance. Therefore, they rather use their NVB to communicate their motives, which is to get their teammates to perform. A player that want their teammate to concentrate and perform better, will more likely use energization or emotional validation to lift their spirit, than being angry and frustrated when their teammate is not performing, because they are more likely to get a performance from them by being uplifting rather than being obstructive. As football players, we are told by our coaches that we need to stay positive to each other and reinforce positive incidents rather than concentrate and use time on the negative ones. For team cohesion to be high, the positive communication is important (LeCouteur & Feo, 2011). Therefore, players probably want the cohesion and the mood in the team be at the top and know that they need to stay as positive as possible to attain that.

Still, most of the negative emotional NVBs were triggered by unsuccessful actions (e.g., A-, shots, D-) by either them or their teammates as well as decisions by the referee. A reason for this can be that emotions are still automatic responses to events that occur suddenly and humans cannot refrain their immediate reaction and response to different forms of stimuli (DePaulo, 1992; Ekman & Friesen, 1969). This reasoning is more in line with the basic emotion theory (Ekman & Friesen, 1967), where although players might try to inhibit their negative reactions, it is not possible to suppress all of their automatic and spontaneous reactions to events in the game (Schlenker & Weigold, 1989). This can be a reason why a great deal of the negative emotions still show. The behavioural ecology theory also states that prototypical anger expression will occur if there is an overtly hostile intention and if there is a relevant audience to receive the message. Knowing this, it is safe to assume that players show disappointment, frustration or anger in more severe situations, when they feel it is very important for their teammates, coaches, referees or audience to understand that they are frustrated and understand their emotions. A player showing negative NVB to a referee, clearly

wants the referee to know that the player is not happy with their decision. Further, players will express negativity to their team, when they need others to know that they are not happy with their own or their teammates' performance. In a high performance team, one have to set a high standard and manage to maintain that standard of performance over a longer period (Williams & Jackson, 2019). Hence, players need to communicate when the performance deteriorate from that standard, even if it is expressed negatively (LeCouteur & Feo, 2011). This is reinforced by the results that show that 19% of the emotional NVBs are triggered by unsuccessful actions and 13% are triggered by successful actions. Most of the times the players' emotional NVB are triggered by unsuccessful actions, they are negative. This shows that the football players are communicating with their teammates that the performance needs to improve. Most of the times the players' emotional NVB are triggered by successful actions, they are positive, which shows that players are trying to boost their teammates to keep the performance that high.

### **5.1.1 Characteristics of the different position's NVB?**

This is the first study where it is looked at the positions' NVB, especially their tactical NVB. This necessarily makes discussing the tactical NVB more speculative. The findings also needs to be compared more with how the game of football is played as well as giving logical reasons, as there are not any other studies to compare these types of results with. The results revealed that centrebacks communicate the most on average to the other positions and are the ones that the other positions communicate the most with. Results also showed that wide attackers communicate the least to the other positions and strikers are communicated with the least.

One of the reasons for the results, can be the teams' formation. The formation in a football team decides how many players play in the different positions and how far the positions are normally away from each other. A 4-4-2 formation means that there are two strikers on the pitch and therefore, a striker can communicate with another striker, whereas a 4-3-3 formation means that there is only one striker on the pitch and therefore, a striker cannot communicate with another striker. The same can be said for the midfielders where in a 4-4-2, there are only two central midfielders on the pitch, while in a 4-3-3, there are three central midfielders. This affects the number for how many times each position can communicate with a player in the same position. For instance, there is only possible to have one goalkeeper on the pitch at a time. Therefore, it is not possible for a goalkeeper to communicate to another goalkeeper at

any time. Thus, it is logical that centrebacks and central midfielders are the positions that communicate the most with each other as well as communicate the most with the other positions, because formations such as 3-4-3, 4-3-3 and 3-5-2 has either three centrebacks or three central midfielders or both. Additionally, the findings show that the further forward or the further away the positions are from each other, the less they communicate with each other. The goalkeepers and strikers are the ones that communicate the least with each other, which makes sense, because they are the furthest away from each other. Likewise, if a team plays a 3-5-2 formation, the wide backs will normally play a lot closer to the strikers and it is more likely for them to communicate more to each other. Although, in a 4-3-3 formation, the wide backs would likely not play as close to the striker and therefore they would not communicate as much to each other.

However, the NVB frequency is not affected by the formation, as it is how many NVB expressions the different positions convey per minute on average. The Kruskal-Wallis H test showed that the NVB frequency was significantly affected by what position the players played, where pairwise comparisons revealed that there was a significant difference between central midfielders and goalkeepers, wide attackers, strikers, wide backs and centrebacks. There was also a significant difference between centrebacks and goalkeepers, wide attackers, strikers as well as wide backs. There was however no significant difference between goalkeepers compared to wide attackers, strikers and wide backs. Additionally, there was no significant difference between strikers compared to wide attackers and wide back and between wide attackers compared to wide backs. Furthermore, when communicating tactically, centrebacks communicate more on average to their teammates as well as having in total the most tactical NVBs throughout the 14 analysed matches. LeCouteur and Feo (2011) stated that verbal and nonverbal communication depended on the player's visual access to the defensive situation. Centrebacks are very often in the central parts of the pitch and further back, where they are able to see more of the pitch and perceive more information than the other outfield players (Jordet et al., 2020). And when the opposition gets near their goal, the centrebacks are often tightest to the action and the opponents when they approach the goal. Therefore, centrebacks will have perceived more information and are most likely to have more information to communicate to their teammates more than the other positions (Jordet et al., 2020). A reason why goalkeepers have a lower NVB frequency than centrebacks as well as not directing their teammates as much, even though they play as central on the pitch and

even further back, could be that goalkeepers are not as close to the other outfield players as the centrebacks. If the team is higher up on the pitch, a goalkeeper would be quite far away from the other outfield players and therefore it would be hard for a goalkeeper to manage to communicate nonverbally to the others. A centreback is much closer to the others and it is way easier for a striker or a wide attacker to receive a message from a centreback than a goalkeeper when their team is trying to stay higher up on the pitch.

Furthermore, the results on the player positions showed that central midfielders asked for the ball the most on average and the goalkeepers asked for the ball the least. A reason for this could be the teams' tactics and playing style. As a football team wants to win the game by scoring goals, the main aim would be to get as close to the opposition's goal as much as possible (Bergo et al., 2002). Therefore, a player further up on the pitch like a central midfielder would ask more for the ball than a goalkeeper as the team collectively wants to get higher up on the pitch. However, a reason for why a central midfielder would ask more for the ball than a striker or a wide attacker that are even higher up on the pitch, could be that a central midfielder is right in the middle between all of the other players in the team. Thus, a lot of the time the ball would have to go through the middle and to a central player before it can be passed further to another player. However, even though the central midfielders asked more for the ball on average, the wide attackers had the highest percentage of their tactical NVB being asking for the ball. A reason for this could be that a central midfielder needs to do more than just ask for the ball. Since a central midfielder is right in the middle of a team's interconnective play, they would have to do more than just asking for the ball. They would need to direct their teammates to position themselves correctly both offensively and defensively. And they would then have to ask for the ball to then get the ball to those in front. A wide attacker would not have to focus as much on directing their teammates since they are supposed to focus on creating offensively (Williams & Jackson, 2019). Therefore, they can focus more on getting the ball, hence why their percentage is higher than the rest of the positions. On these grounds, it is logical for a central midfielder to ask more for the ball on average than the players further up on the pitch, but also that the players further up has a higher percentage of their tactical NVB being asking for the ball.

Figure 10 (page 54) shows how the different positions behave emotionally on the pitch. The results illustrate that the further back on the pitch you play, the more you tend to be positive, while the further up on the pitch you play, the more you tend to be negative. Reasoning for

this could be that most of the positions react emotionally to situations that occur closer to them or where they are involved. Logically, players that play further up would then react more to incidents near the opposition's goal. Therefore, since we did not analyse NVB right after goals scored, most of the reactions of the players further up would have to be unsuccessful attacking actions such as missed shots, unsuccessful passes, crosses or dribbles. The players further back would more often react positively as they would perhaps react to more successful actions further back on the pitch, since we did analyse behaviours right after goals were scored.

### **5.1.2 Does playing home or away affect a player's NVB?**

The players in the home teams had a higher average of NVBs ( $M = 157$ ,  $SD = 119$ ) than the players in the away team ( $M = 151$ ,  $SD = 98$ ), although both of the teams' players had the same NVB frequency. Results from the statistical tests revealed that the players in the away team asked significantly more for the ball ( $M = 19.8$ ,  $SD = 20.2$ ,  $p = 0.014$ ) than the home teams' players ( $M = 13.8$ ,  $SD = 13.7$ ) and tried to influence the referee ( $M = 12.8$ ,  $SD = 11.7$ ,  $p = 0.045$ ) significantly more than the home teams' players ( $M = 11.4$ ,  $SD = 13.8$ ). However, there was no significant difference between the teams' players when directing their teammates. As there are no previous studies looking this extensively at a football player's NVB during a match, finding a reasoning for the differences in the home and away teams' tactical NVB can be challenging. However, it is possible to compare some of the findings from these results and studies on emotional behaviours.

Lefebvre and Passer (1974) interpreted that football teams who play away from home, commit more fouls and play more aggressive, because playing away from home can be looked at as a frustrating experience, which again results in more aggression and consequently more fouls being committed. The players in the away team asked significantly more for the ball than the players in the home team. Asking for the ball is looked at as an assertive behaviour, as by asking for the ball, the player shows that they are confident in their own abilities to do something good with it (Furley & Schweizer, 2014b). Although, the home teams were perceived as more confident before the match (Furley et al., 2018), findings from this study show that the away teams' players ask more for the ball. A reason could be that the away teams are trying to overtly seem more confident and convey such behaviours to spread it to their teammates, as they know it is harder to win away from home (Gómez-Ruano et al., 2021). Influencing the referee can be looked at as a more aggressive behaviour as when



players are trying to influence the referee, they are often disrupting the play by complaining and protesting the referee's decision or trying to get the referee's decision in their favour. An explanation for why the away teams' players tried to influence the referee, can be referee bias or perceived referee bias (Varca, 1980). A referee can be influenced by how big the home crowd size and their reactions and noise could make the referees call less fouls against the home team as well as giving more decisions in their favour (Boyko et al., 2007). The away teams' players possibly know they have to influence the referee to even the scale and get more "correct" decisions in their favour. Contrarily, home teams' players probably know they do not have to try to influence the referee as much to still get decisions in their favour, and therefore do not try as much to influence them.

The players in the home team had both a higher positive emotional NVB average ( $M = 17.79$ ,  $SD = 15.2$ ) than the away teams' players ( $M = 14.25$ ,  $SD = 12.65$ ), as well as a higher negative emotional NVB average ( $M = 11.29$ ,  $SD = 10.34$ ) than the away teams' players ( $M = 9.99$ ,  $SD = 10.3$ ). Results show that both the home teams' and away teams' players emotional NVB were mostly triggered by unsuccessful attacking actions (A-), the game restarting and decisions by the referee. These findings complies with the results from Furley et al. (2018) study which showed that perceivers rated the home teams' players higher on assertiveness, dominance and aggression compared to away teams' players, regardless of being professional or amateur. The home teams' players had the most emotional NVBs, both negative and positive. The home teams' players react more to successful attacking and defensive actions, which can signal assertiveness as well as dominance. The home team also react more to unsuccessful attacking and defensive actions and decisions by the referee, which can signal aggressiveness. The home team also reacts more to the game restarting and shots, which can signal dominance. Players reacting to successful actions by either themselves or their teammate can signal assertiveness, because when you show someone that they have done something good, you transfer confidence them. It can also assert dominance as the players in the home team are more positive and energizing their team whenever they do something good to show how well they are playing and consequently intimidate the opposition. The home team signal aggressiveness by having more negative emotional NVBs and reacting more to unsuccessful action because they are signalling to themselves, their teammates, coach or supporters that they are not satisfied with the performance and want to do better (perhaps show more aggressiveness). Likewise, by reacting to a lot more of the decisions by the

referee, shows that they are challenging the referee substantially more than the away team. However, these findings contradict the findings from Varca (1980) who stated there was a higher likelihood of a team committing fouls and aggressive behaviours when playing away from home. Moreover, Lefebvre and Passer (1974) interpreted that football teams that are playing away from home show more aggression, because playing away from home is looked at as a frustrating experience, which again results in more aggression.

By this study's findings, it seems the home teams show the most aggression by reacting the most to decisions by the referee as well as reacting the most to unsuccessful actions. However, Varca (1980) suggested that the higher the difference between winning percentage at home and away, the higher the likelihood of aggressiveness. Since this study gives us just a snapshot overview of the players' and teams' NVB in one match each, we would not know the winning percentage of home and away games to the teams prior to the matches analysed. Therefore, it is difficult to know if the reason for more aggressive home teams, could be because of the home teams bad winning percentage at home prior to the analysed match. Although Varca (1980) explained it is possible for a referee to be affected by the home supporters' harassment and therefore give more decisions in the favour of the home team, the results revealed that the home teams' players were triggered the most by the referee's decisions. This could consequently result in a more aggressive home team that feels the referee does not give enough decisions in their favour, although they feel the referee should. The results from the tactical NVB also showed that the away teams' players try to influence the referee the most. Thus, a reason for the home teams' players showing more aggressive behaviours could be that the away teams' players try to influence the referee to get more decisions in their favour. And as the referee does not want to seem too bias to the home team and their supporters, he or she manages to be influenced and gives more decisions in the away teams' favour. Therefore, the home teams' players react more emotionally to the referee's decisions as they perceive them as being bias towards the away team, and thus express more aggressive behaviour.

### **5.1.3 Does playing for a winning, drawing or losing team affect a player's NVB?**

The players in the teams that won had the highest NVB frequency average ( $M = 2.0$ ,  $SD = 1.1$ ), the players in the teams that drew had a little lower NVB frequency ( $M = 1.9$ ,  $SD = 0.8$ ) and the players in the teams that lost had the lowest NVB frequency average ( $M = 1.8$ ,  $SD = 1.1$ ). These results are comparable to the results of Lausic et al. (2009), which showed that winning

teams had an expected frequency of 6.75 behaviours per communication pattern and the losing teams had an expected frequency of 2.33 behaviours per communication pattern, meaning the winning teams exchanged twice as many messages as the losing teams. Results from Lausic et al. (2009) also revealed that winning teams displayed significantly different communication sequences than the losing teams. More precisely, winning teams had a more consistent model of communication. Compared to Lausic et al. (2009), this study's results showed a very small difference between the teams, with the winning teams' players averaging two NVBs more in a minute than the players in the losing team. Even though the difference in this study showed a very small difference between the teams' players, the winning teams' players are averaging two NVBs more in a minute than the players in the losing teams. This means that for an entire 90-minute match some of the player in the winning team has displayed 180 more NVBs than the losing teams' players. This could in extraordinary incidents mean that the winning team has conveyed several hundreds more NVB expressions than the losing teams. Therefore, if you look at the bigger picture, the difference could have a greater effect on the teams than what was first expected.

In this thesis drawing teams ask for the ball significantly more than losing teams. Although there was no significant difference between the other teams and with the other tactical NVBs, results showed that losing teams directed their teammates more than teams that drew or won. Lausic et al. (2009) suggested that a smaller number of communication patterns in tennis doubles could indicate a more limited effectiveness in coordinating actions and therefore having to solve problems more "on the fly". The study's results contradict this suggestion slightly, however, that players in a losing team directs their teammates more, can indicate that they have to direct their teammates more because of their limited effectiveness in coordinating actions without using more nonverbal communications. LeCouteur and Feo (2011) found that a higher frequency of communication between defenders occurred when the opposition's attackers got near their goal. Therefore, a reason for why losing teams' players direct their teammates more, can be because the winning teams are considerably more often near their goal than they are near theirs.

The players in the teams that won initiated touching ( $M = 4.9$ ,  $SD = 5.2$ ) slightly more during a match than the players in the teams that drew ( $M = 4.3$ ,  $SD = 5.1$ ) and even more than the players in the teams that lost ( $M = 3.2$ ,  $SD = 3.4$ ). These results can be related to Kraus et al. (2010), whose results showed that teams who showed a higher frequency of touches in

matches and early in a season, tended to perform better throughout the season and end up higher on the table. Likewise, Bornstein and Goldschmidt (2008) findings showed that teams whose goal scorers showed more team-oriented behaviours such as physical touch, tended to end up higher on the table at the end of the season, than teams whose goal scorers showed less team-oriented behaviours and more self-oriented behaviours after scoring a goal. Although these two studies are longitudinal studies that looked at how NVB can predict performance throughout an entire season, one can see similar findings throughout a single match. The question is whether results provoke the team-oriented behaviours such as physical touch or if the team-oriented behaviours provoke performance and results. It is easier to perform team-oriented behaviours when their team is performing, whereas a team that is not performing, are more unlikely to perform as many team-oriented behaviours.

When examining the emotional NVB of the teams, the players in the teams that won had a positive emotional NVB average of 17 registrations during a match, the players in the teams that drew had an average of 18 positive emotional NVB registrations, while the players from the teams that lost had a positive emotional NVB average of 14 registrations. The players in the teams that won had a negative emotional NVB average of 9 registrations during a match, the players from the teams that drew had an average of 15 registrations, and the players in the teams that lost had a negative emotional NVB average of 13 registrations. Winning teams reacted more on successful actions than the other teams and also less on unsuccessful actions. They also reacted less to the referees decision and more on shots. This indicates that a winning teams focuses more on being positives as well as their own performance, while the teams that lose and draws focuses more on bad actions and are more negative. This is of course speculative as it is not possible to know for certain what the players are thinking and focusing on without being them or asking them about the situations afterwards. The emotional NVB results also coincides with Bornstein and Goldschmidt (2008), as they suggested that post-performance behaviours, could be an indication of a team's cohesion level and how well the players work and fit together as a team. When players in a team displays more positive emotional behaviours as well as less negative ones than their opposition, it indicates that their cohesion level is higher and that they work better together. This seems more valid as these teams are the ones that won their matches.

## **5.2 How the NVB change as the score changes during the match?**

The players have the highest NVB frequency when ahead ( $M = 2.02$ ), slightly lower when level ( $M = 1.86$ ) and the lowest when they are behind ( $M = 1.75$ ). The results can be compared with Furley and Schweizer (2014a) findings which revealed that athletes who are trailing, are perceived as more submissive and passive in their NVB, than athletes who are leading. After looking at this study's results and comparing them with Furley and Schweizer (2014a) study, it would be safe to presume that being ahead, level or behind affects a player's NVB. When a team is trailing it is easier for a player to become passive and more withdrawn as being behind can make players feel shame and want to hide (Furley et al., 2015; Furley & Schweizer, 2020). While, when a team is ahead, players would express themselves more and show more dominant NVB as they feel pride in performing (Furley & Schweizer, 2020).

Furthermore, this study found that players in the teams that won had the highest NVB frequency when they were behind ( $M = 2.17$ ) and when they were level ( $M = 1.98$ ), and the players in the teams that drew had the highest NVB frequency when they were ahead ( $M = 2.21$ ) and lastly the players in the teams that lost had the lowest NVB frequency when they were behind ( $M = 1.7$ ). These results have similarities with Lausic et al. (2009) who found that winning teams exchanged twice as many messages as the losing teams. However, Lausic et al. (2009) results revealed that there was essentially no difference between the patterns of communication preceding winning or losing outcomes across winning and losing matches. In this study, the teams that lost, were never ahead, so it was not possible to compare the teams in all of the different scores. This makes the results limited as it is unknown whether a team that lost, would have a higher or lower NVB frequency than the other teams when they were ahead. Still, the results show a clear pattern for the different teams that teams that win generally have a higher NVB frequency throughout the match than teams that draw or lose. An interesting part of the results is that the players in the teams that won had the highest NVB frequency when they were behind, but not when they were ahead. This could indicate that winning teams lower their NVB frequency when ahead, as they feel more in control and do not have to communicate to each other that much, however, when they go behind, they know they have to become more active and communicate more to turn the result around. Lausic et al. (2009) also revealed that winning teams had a more consistent model of communication. Those results match this study's findings, as the winning teams players' NVB frequency

gradually rises as they go behind, the drawing and losing teams players' NVB frequency drops substantially more when they go behind.

When the home teams are ahead, their players have the highest NVB frequency ( $M = 2.18$ ) and their lowest NVB frequency is when they are behind ( $M = 1.78$ ). The away teams' players have their highest NVB frequency when they are level ( $M = 1.95$ ) and the lowest when they are behind ( $M = 1.70$ ). The home teams players' NVB frequency gradually falls from when they are ahead to when they are trailing. Whereas the away teams players' NVB frequency stays at a lower but more consistent rate through the game statuses. Even though the away teams players' NVB frequency is the lowest out of the teams when being behind, the home teams' players NVB frequency has a greater deviation from being ahead to level or behind. The home teams' NVB frequency is significantly higher than the away teams' when the teams are ahead and when they are behind. A reason for this could relate to the teams' expectancy of the match. Home teams are often considered favourites to win a match because of the home advantage (Gómez-Ruano et al., 2021). Away teams' players might then expect less to win and therefore have generally less reactions to the game status and are a little more passive and have less NVBs in general. On the contrary, the home teams' players expect more from the match as they might be perceived favourites. Therefore, when they go ahead, the NVB frequency is high. One would believe that the home team would manage to keep a high NVB frequency when they go behind, since they have high expectations for the match, yet the home teams' NVB frequency is quite lower when they are behind or level. A reason for this could be that the home teams does not handle being level or trailing as good, because of the bigger expectations they and their supporters have over the match.

### **5.2.1 How does the tactical NVB change when compared with score?**

Both the home teams' and away teams' players direct their teammates the most when they are level with the home teams' players directing their teammates 78.1% of their tactical NVB, while the away teams' players directing their teammates 72.4% of their tactical NVB. The home team directs their teammates the least when they are behind (76.5%), while the away team directs their teammates the least when they are ahead (67.8%). When the teams are behind, both the teams' players are influencing the referee more and ask for the ball less. The home teams influence the referee 12.9% and ask for the ball 10.6%, while the away teams influence referee 14.9% and ask for the ball 13%. When the away team is ahead, they ask for the ball more (20.2%) and influence the referee less (12%). Interestingly, when the home team

is ahead, they try to influence the referee more (13.7%) and ask for the ball less (9.3%). The home teams' players direct their teammates significantly more than the away teams' players when the teams are ahead and level. However, the away teams' players ask for the ball significantly more than the home teams' players when the teams are ahead or level. That there was a significant difference between the home teams' and away teams' players in directing their teammates and asking for the ball shows that the teams have a different focus when they are ahead or level. The home teams' players focus significantly more in directing each other on what to do, while the away teams ask significantly more for the ball. The findings could indicate that the home teams focus more on the teams' collective performance, as directing teammates is an action where one tells others what to do and how to perform. While the away teams' players focus more on their individual performance as asking for the ball entails that one is focused on the ball and has thought about what to do with it. The biggest difference between the teams is when they go ahead. The players in the home teams ask the least for the ball when they are ahead, while the players in the away teams ask for the ball the most when they are ahead. Asking for the ball is looked at as an assertive behaviour, however, one would not believe that the home teams' players are losing more confidence when they go ahead, than when they are level or behind. A reason for the numbers can have something to do with the teams' possession. As the game progresses, the teams' percentage of ball possession changes as well. A team that concedes a goal, will probably try to keep a hold of the ball as much as possible to try to equalise. So a team conceding could result in that team getting a higher percentage of ball possession. Results from Bradley et al. (2013) showed that position-specific changes in physical profiles (e.g., running intensity, running distance) and technical profiles (e.g., touches of the ball, passes, dribbles) were noticeable in teams that had different percentages of ball possession. Therefore, the differences in the home and away teams' tactical NVB after they go ahead or behind, could be because they have less of the ball and therefore cannot ask as much for the ball. Another reason could be that the home teams' players do not feel there is that big of a need to constantly ask for the ball and try to make things happen on their own when they are ahead and the team is in control of the game. While the reason for why the away teams' players are asking the most for the ball when they are ahead can be that they are oozing with confidence as they are in the lead away from home, which is looked at as a more challenging place to perform (Gómez-Ruano et al., 2021). The players in the away team direct their teammates the least when they are ahead, which could

indicate that the away team feels they are more in control of the game and therefore do not need to direct their teammates as much, since the current result indicate they are performing well.

Results showed that when the teams are ahead the teams that won directed their teammates (35% of their tactical NVB) and influenced the referee the most (30% of their tactical NVB), while the teams that drew asked for the ball the most (49% of their tactical NVB). The teams that lost were never ahead in the matches they were analysed, so it is unfortunately not possible to compare them with the teams that drew or lost when the teams were ahead. When the score is level, the teams that lost direct their teammates the most (54% of their tactical NVB), while the teams that drew influenced the referee (28% of their tactical NVB) and asked for the ball the most (40% of their tactical NVB). When the teams are behind, the teams that lost still direct their teammates the most (44% of their tactical NVB), the teams that won influenced the referee the most (54% of their tactical NVB) and lastly, the teams that drew asked for the ball the most (48% of their tactical NVB). The statistical tests showed that there was a significant difference between the teams directing their teammates when level or behind and separate univariate tests and figure 20 (page 61) show that the teams that lost direct their teammates significantly more than the teams that drew or won when the teams were either level or behind. Furthermore, the tests showed that there was a significant difference between the teams influencing the referee and asking for the ball. Separate univariate tests as well as figure 20 (page 61) illustrate that when the teams are behind, the teams that won try to influence the referee significantly more than the teams that drew or lost. The tests also showed that the players in the teams that drew ask for the ball significantly more for the ball than the teams that won or lost regardless of the teams being ahead, level or behind.

That the teams that lost direct their teammates significantly more when the teams are level or behind, reinforces the case that teams that direct their teammates the most can indicate a teams limited or poor ability of coordinating actions without using more nonverbal communications. Even though a higher frequency of communication is seen as essential for team performance (LeCouteur & Feo, 2011) and a small number of communication could be seen as a limited ability of coordinating communication (Lausic et al., 2009), directing ones teammates can indicate that the players need more help in making decisions and coordinating their defence or offense or that they are more often wrongly positioned and need guidance. The results on directing teammates can tell us that teams that lose need to focus more on



directing their teammates, because either their tactics or their ability to execute the team's tactics is not as effective as the teams that won or drew. When the teams that drew or won go behind, they do not focus as much on directing each other, which could indicate that their tactics are still working and they just got a bit unlucky. It can also suggest that the players still believe in their tactics and have a better ability to execute the team's tactics, even when they are behind. Therefore, they can focus more on the other ways of impacting the match, such as asking for the ball more and trying to influence the referee. The teams that drew ask more for the ball when they go behind, which implies that they try to take matters into their own hands (or rather their feet in this case), while the teams that won try to influence the referee more, which indicates that they are trying to get the referee more on their side when they are struggling.

### **5.2.2 How does the emotional NVB change when compared to score?**

70.7% of the home teams' emotional NVB is positive when they are ahead, while the away teams' positive emotional NVB is just at 62.8% when they are ahead. Although, as the home team goes level or behind, their positivity falls substantially (from 70.7% when ahead to 62.6% when level and 49.9% when behind), the away team manages to stay more consistently positive throughout the different game statuses (from 62.8% when ahead to 57.4% when level and 57.5% when behind). The statistical test showed that the odds of the home teams' players conveying positive emotional NVB are 2.44 times higher when they are ahead than when they are behind. However, they are also 2.43 times more likely to convey negative emotions when they are behind than when they are ahead. Contrarily, the away teams' players are only 1.25 times more likely to convey positive emotions when ahead than when they are behind and only 0.8 times more likely to convey negative emotions when behind than when they are ahead. These results can be somewhat explained by the perceived home advantage (Gómez-Ruano et al., 2021). As the home teams' players probably expect more of the game as they are playing at home and are probably perceived as favourites. They start off by being the most positive out of the teams. Furley et al. (2018) demonstrated that home teams' players show more assertive and dominant NVBs before a match than the away teams' players. The away teams' players does perhaps not expect as much since they are playing away from home. Therefore, they start the match by being less positive and more negative than the home team when things are level. And as the game progresses, when the home teams lead, they become even more positive to boost themselves up and keep the pressure and positivity going.

Furthermore, the away teams' players become less positive when they are behind, but it does not differ too much from when they were level, as they probably did not have that big expectations to the match beforehand. When the home teams are behind, they become more negative than positive, while the away teams become more positive when they go ahead, though not by much. The home teams' positivity drops all the way from 62.6% when level to 49.9% when they go behind. While the away teams just drops from 62.8% when level to 57.4% when they go behind. The results show that home teams convey more frustration and negativity when they are trailing, and a reason could be because they are playing at home, supposed favourites for the match and should have an advantage. Therefore, when they go behind, they do not know how to cope as well and become more frustrated and disappointed in each other's performances. While the away team manages to handle going behind considerably better, because they do not have as big of expectations to the game, as they know they are away from home and probably perceived underdogs (non-favourites). The expectations on a match can affect how emotional a player becomes (Lazarus, 2000). A home team can let the emotions get the better of them, because for them there is more at stake, and they feel a higher pressure to perform. Therefore, when they go ahead, they become overly delighted and positive, however, when they go behind, they become substantially more negative. The away team does perhaps not feel as high a pressure, and therefore manages to have a more stable and consistent emotional NVB when they are ahead, behind or level.

The teams that won are the most positive when they are ahead (68.7%) and the least positive when they go behind (43.6%). The teams that drew were the most positive when level (55.9%), and the least positive when they went behind (43.5%). The teams that lost were the most positive when they were level (68.6%), and the least positive when they were behind (56.1%). The winning and drawing teams are significantly more negative than the losing teams when the teams are behind. The losing teams and winning teams are significantly more positive than the drawing teams when the score is level. The winning teams are 14.7% more positive when ahead than the teams that end up drawing. When the score is level, the teams that end up losing, are the ones that are the most positive with 12.7% more positivity when the score is level than the drawing teams and 3.9% more positivity than the winning teams. When the teams go behind, the teams that end up winning and drawing are more negative than positive. However, the teams that end up losing, surprisingly manages to stay more positive than negative when they are behind. How the players convey their emotions can be an insight

to their mental state and their mindset for the rest of the match (Furley & Schweizer, 2020). Additionally, how they behave and manage to cope with struggles can and most likely will impact their own and the teams collective performance (Williams & Jackson, 2019). Knowing this, one would believe that how the teams react to going behind, can determine whether the teams manage to turn it around. One would then believe that it would help to stay positive even though the team is behind and try to give each other energy and encouragement. However, the teams that ended up drawing and winning conveyed more negative than positive emotions when they went behind, while the teams that ended up losing conveyed more positive emotions. Meaning, that the teams that actually ended up turning the result around are more negative when they are behind. A reason for this could be that the winning and drawing teams are acting more like high performance teams that will not let their teammates deteriorated too much from the high standard the teams had set before the match (LeCouteur & Feo, 2011; Williams & Jackson, 2019). The results show that the drawing and winning teams' negative emotions are more constructive than destructive, as they manage to use it to pull themselves together. Contrarily, the teams that end up losing, might stay too positive as the players are not demanding higher performances from each other and therefore they do not manage to turn it around. This could indicate that when winning or drawing teams go behind, they get more together and manage to have a strong mindset to turn things around. While the losing teams seem more indifferent to going behind as their emotional NVB do not change that much when they go behind and therefore, they do not have as strong a mindset to turn things around as the other teams.

### **5.3 Methodological strengths and limitation**

This study is a non-participatory observational study where football players in the Premier League are observed during a football match through video footage. Furthermore, it provides a new way of examining NVB as it is an observational study where football players are observed and analysed during an entire football match. As this is part of a new project and a new way of examining athletes' NVB, some possible limitations must be discussed. For research examining sport performance, observation in real-live sport competitions can increase external validity, but also lead to a decrease in internal validity because of the lack control over all additional variables. The non-participatory observational study helps us get no drop-outs as we are analysing matches that have already been played. This is the first study that looks this extensively at athletes' NVB throughout an entire match. Consequently, there

are very few methodologically similar studies to compare with, however this makes it possible to build the limitations on potential future research. This type of design gives us a snapshot view of all the different teams' NVB in the Premier League and as there is a sizable selection with many players, we get quite a good and describable overview of how a Premier League player's NVB is in a match. A strength of this design is that the players are being analysed for an entire match. Compared to thin-sliced studies where players are observed for moments (see Furley, 2021b for a review), this study examined the players' NVBs for an entire match. Thus, giving us a far bigger picture and overview of the players' NVB than in a thin-slice study. It is however a very time consuming method as every single player that played the selected matches are analysed and every match lasts at least 90 minutes. One needs to look at the same match for a minimum of 11 times and it will last for most of the times a minimum of 90 minutes. And even though every team is being analysed, as the teams are only analysed for one match each, we do not get further context to their behaviour. Therefore, we do not get to analyse every single player in the teams' player squad. Furthermore, we do not look at the matches previous to the analysed match, so we do not know whether there are teams or players who are in great or poor form leading up to the match. And as we do only analyse each team for one match, we do not know whether the behaviours they convey are a "one-off" because of that exact game and if their behaviour would change substantially in a different setting or if their behaviour is in fact their typical behaviour.

This study used descriptive coding to analyse the matches. The differentiation between descriptive and evaluative phases in the measurement process shows that NVB must first be described objectively, and then secondly, its interpersonal effects must be tested independently. However, there is a challenge to assign a meaning to the specific movements, as well as this procedure is highly time consuming. The aim of this study was to categorise the players' NVB and hopefully enable its connection to the different level of their psychological and emotional state and thus find out what characterises a player's and a football team's NVB in a football match and how the NVB changes as the score changes during the match? Evaluative coding does not provide descriptions of behaviour, but rather assessments of the appropriateness of certain psychological categories. This means that the goal of evaluating coding is to obtain subjective impressions of observers, hence, evaluative coding is not a very suitable method for describing behaviour nor as a tool for encoding studies (Bente et al., 2008, p. 272). The advantage of a descriptive coding system is that they

give clear-cut information on the actual bodily movements which are shown. The main problem in descriptive coding is the availability of regulated procedures for an unbiased and detailed documentation of human behaviour and gestures. Even though the system still needs coders, the systems make use of detailed behaviour protocols which enable high degrees of reliability and objectivity (Bente et al., 2008, p. 272). The benefit of using automated coding, is that it is much more time efficient, as well as giving better space resolution and being able to capture more subtle expressions. The downside of this approach is that the devices are often impractical for natural settings, as they require attaching sensors and the installation of stationary laboratory equipment (Bente et al., 2008, p. 272). Because of this, descriptive coding was the strongest option of analysis, even though the method has its limits.

The selection for this study was players in the Premier League. Observing the players in the Premier League can give us a baseline for how football players' NVB is at the highest level as it is the #1 ranked league in Europe and in world football. However, coaches and referees were not analysed. A coach can affect a team's behaviour greatly (Smith & Strand, 2014) and a referees behaviour can have an effect as well (Furley & Schweizer, 2016). Likewise, there is a limitation in the generalisation of the league and players. As the Premier League is the first league that has been analysed, it is no way to be sure that other leagues will generate the same type of results. Culture can play a big part in a player's NVB (Furley, 2021b). And as players in other leagues have other nationalities, their culture might affect their NVB differently than the players in the Premier League. When it comes to the inclusion and exclusion criteria for the selection, there are both strengths and limitations. When the aim of this study was to get an overview of the NVB in the Premier League, the selecting all of the teams in the league, is without a doubt a strength. To get a characterisation of the Premier League teams, one would need to analyse all of the teams. However, there is a limitation in only analysing the teams for one match. Even though it would be too time consuming to analyse all of the teams for several matches, only analysing them for one match can make some of the games and players' behaviours more of an anomaly and not the normality. To know for sure whether their behaviour is more of the normality, it would be ideal to analyse the same players in several games. Another feature of the inclusion criteria is that the matches being analysed had to have a maximum of 2 goals differentiating the teams at full time. The reasoning for the first inclusion criteria was that it is believed that contextual factors will affect a football players NVB. In the Premier League, teams very rarely come back from a 2+ goal deficit (Smith,

2017). When a team gains a 2-goal lead, they win 90% of the time, draw 7,4% of the time and lose 2,6% of the time (Smith, 2017). Therefore, analysing tight games where everything is still to be played for, we are more likely to get the players' "natural" behaviour and not anomalies where players are showing substantially more submissive or dominant behaviours because they are leading or trailing by much (Furley et al., 2012). Another limitation in the inclusion criteria is that there were not an equal amount of home teams and away teams, and not an equal amount of teams that won, drew or lost. Additionally, none of the teams that lost were ever ahead in the matches that were analysed. This could limit how the differences in behaviour between the teams actually are.

There are some limitations with the video footage as well. Tactical and broadcast view did not always show every single player, and goalkeepers are the least in the video footage out of all the players. If the ball is further up one side of the pitch, the camera will pan more over to that side of the pitch. Hence, the goalkeepers who are the furthest back are not visible quite as often as the other outfield players. This would of course only last a couple of seconds maximum at the time, however, this could be a reason for why the goalkeepers generally do not have as many registered behaviours, because the coders could not see them when they conveyed some behaviours. Still, one of the goalkeepers registered over 400 NVBs, which is more than twice as much as the average of the players that played for 90+ minutes. Therefore, one can believe that the goalkeepers were still in the video footage more than enough to get a accurate enough analysis of their NVB.

All of the variables are operationalised by arm movements which are looked at as "unnatural" arm movements. Natural arm movements when running, jumping or stopping have not been analysed. Reason why they have been limited to only arm movements, is another limitation of the video footage. Because for about 50% of the game you can only observe the analysed player from the far side of the pitch or only see the players from the back. When they are either too far away to observe smaller behaviours or when you observe them from the back, it is impossible to see behaviours like facial expressions. In this case, it is almost impossible to see any other types of NVBs other than arm movements since they extend from the player's body. Moll et al. (2010) looked solely on what types of arm-movements the players do when celebrating a goal in a penalty shoot-out, while this study looks at a lot more context around the arm-movement and what it represents. With this considered, looking at just arm-movements, should be enough to characterise the players' NVB. However, to afford to only

analyse the players by their arm-movements, the study needs to have good concept validity, which determines how strong a study's validity is (Laake et al., 2013). The operationalisation of the terms being studied needs to be precise and easy to understand for the concept validity to be strong. Wiener et al. (1972), Furley (2021b) and Matsumoto, Hwang, et al. (2013) as well as having a full team of personnel from Norwegian School of Sport Sciences helped define NVB before conducting the study to make the concept validity as strong as possible. After the concept validity had been sorted for, it was then possible to analyse the players NVB through only their arm-movements. The strength in analysing the players arm-movements is that arm-movements are objective. It is clear to see when a person's arms are moving or not. However, when analysing a player's emotions from arm-movements, a lot of the interpretation is subjective. Only the player themselves will know what they are feeling at that exact moment, and therefore it becomes more speculative on what emotions the players are actually feeling, even though it is possible to analyse what emotions they are conveying.

The reliability tests have some limitations. The IOR tests does not exclude subjectivity. The Cohen's kappa coefficient test showed mostly good strength of agreement between the coders. However, there was never a total agreement between coders and even though a good strength of agreement is more than strong enough, some form of subjectivity will always cause some disagreement between the coders. And as interpretations of emotional NVB become more subjective and speculative, they were the variables that had the lowest strength of agreement between the coders. The IAOR test were in later realisation probably done too soon after the initial analysis. As the IOAR test occurred 4 weeks after the initial analysis of the player, a form of recency bias is possible where the main coder remembers some of the situations and is therefore more likely to choose the same variables as in the initial analysis. However, this is almost unavoidable as every match is observed a minimum of 11 times and in some cases over 22 times.

#### **5.4 Future research**

This study is the first of its kind looking at NVB in a sporting/football context and therefore builds on a lot of potential future research. Consequently, there is a need for more studies looking at football players' NVB. This study only examined the players' arm-movements. A study could be conducted where more of the players' NVB is examined such as facial expressions or posture. Comparing other leagues and professional and amateur football players is endorsed to provide further information and a wider sense of what characterises a

football player's NVB. There is a need to know what separates the players' NVB in different countries and what separates the professionals from (elite) youth players. Furthermore, this study has only looked at each of the Premier League teams for one match. Further research could conduct longitudinal studies where one or a few teams are analysed throughout an entire season, to look more extensively how a player's and team's NVB change as the season progresses and their form change. Other studies could look at what characterises the players in the teams that end up higher up on the table versus those that end up further down, like Kraus et al. (2010) did with tactile communication (physical touch) in basketball teams. In this study, the NVBs that happened right after a goal was scored (e.g., celebrations, embracing, disbelief, shame) was not analysed as players would probably convey substantially more NVBs in a short amount of time and that would differ too much from a player's normal NVB throughout a match. Therefore, future research could look into how players and teams react to scoring or conceding goals the first 5-10 minutes after it happens to examine further how their behaviour changes after a goal is scored. A study could look at reactions to goals to examine whether a team's reaction to goals for or goals against can predict the end result of the game. More qualitative studies could be conducted by interviewing the players shortly after a match is played to get a better insight to what the players are feeling at the moment of occurrence.

## **5.5 Implications for practice**

The main aim of this study was to describe and understand how football players in the Premier League use their nonverbal behaviour (NVB) to communicate with others. The question that arises, is whether it is possible to use this knowledge of NVB and implement it to practice. To use this knowledge about NVB for performance development, it is vital to look at the word mentality. We know that NVB can have a relation to future performance (Jordet & Hartman, 2008; Kraus et al., 2010), ongoing performance (Lasic et al., 2009; LeCouteur & Feo, 2011; Leitner & Richlan, 2021) and as a consequence of performance (Bornstein & Goldschmidt, 2008; Moll et al., 2010). However, it is still hard to find a direct link between NVB and performance (Furley & Schweizer, 2020). Therefore, one has to be cautious when trying to implement NVB to football practice.

We do know that players' psychological/mental skills have a direct effect on their performance (Bray et al., 2004; Moritz et al., 2000) and we do now know that a football player's NVB can be a direct link to their psychological/mental state (Fridlund, 1994; Furley, 2021b). Therefore, it seems reasonable that if one manages to consciously influence an



athlete's NVB, they can affect their psychological state and consequently their performance. For a player to implement NVB to their ability repertoire, one needs to focus on mentality. It is known that football players who are high on confidence will show more dominant and assertive NVB and football players who are low on confidence will show more submissive NVB (Furley et al., 2012; Furley & Schweizer, 2020). Additionally, it is possible to train football players to become better at nonverbal communication (Naylor, 2007). Could therefore a coach manage to train football players into using NVBs that are associated with confidence, dominance and pride and the players actually end up getting confidence? Would it be possible for players to "fake it till you make it" and achieving feeling dominant and confidence by consciously and manually executing the behaviours related to those feelings? The implication of this study could be that more football players or athletes start to consciously do the NVBs that are looked at as positive and consequently get more positive outcomes<sup>1</sup>.

The tactical NVBs seem to have a more directly effect on a player's or their teammate's performance. A higher frequency of communication can make a team perform better (LeCouteur & Feo, 2011). Good pattern of communication can prevent loss of possession and a lack of communication can result in loss of possession (Williams & Jackson, 2019). Coaches will often let their players know if they need to communicate more, especially when a lack of communication causes the team to lose possession of the ball. Thus, it is clear that players need to learn to communicate for their team to perform well together. However, will learning football players from a young age to use their NVB to communicate, make them perform better, because when we talk about communication, we often mean verbal communication? Directing teammates and asking for the ball more can help a player or the team feel more in control in the situations they are involved in. Shouting to your teammates that you want the ball or where they should make a run, could alert the opposition. However, using your body language, could make it easier to communicate to your teammates without making the opponents aware of what your team is planning (Güldenpenning et al., 2017). And as we know that NVB is possible to train (Naylor, 2007), one can imagine it being possible to build athlete's learning process of NVB and nonverbal communication on some of the same conditions as the motor learning process (Masters & Maxwell, 2008), where football players

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<sup>1</sup> This reference has been cleared by the supervisor, as the assignment the reference is from, has the same topic as this thesis. Thomas Jenssen, 2021, MA404 Fotball og vitenskap.

force themselves to commit certain NVBs and communicate nonverbally to teammates until it becomes more of a habit and automatic<sup>1</sup>. Additionally, a football player that shows more that he or she wants to receive the ball, is more likely to receive the ball more often than a player that does not show for the ball. And a player that is more involved with the ball, has a better chance of impacting the game than a player who is not nearly as much involved (Bergo et al., 2002). And if we train players to communicate more effectively with their teammates from an earlier age, it can have a great effect on the players ability to cooperate and coordinate actions with other teammates.

## **5.6 Summary**

Nonverbal behaviour (NVB) have been looked at more extensively in recent years as the psychology of athletes have been perceived as an increasingly more integral part of an athlete's performance. A number of previous studies, such as Furley and Schweizer (2014a, 2014b, 2015), looked at NVB through evaluative coding and thin-sliced paradigm to show how one perceives athletes' NVB, how athletes behave when they are performing well or badly, and what effect athlete's NVB can have on other athletes. Other studies, such as Leitner and Richlan (2021) looked at what type of behaviours football players convey in a match and Lausic et al. (2009) and LeCouteur and Feo (2011) looked at the tactical NVBs athletes do to try and help teammates perform. These studies as well as others have given a lot of compelling results and awareness for NVB in football and sport. However, these studies have not examined all the different types of NVB an athlete conveys in a match and how an athlete's NVB changes during the match. Based on those grounds, the research question was formed: What characterises a player's and a football team's NVB in a football match and how does the NVB change as the score changes during the match?

This study's findings indicate that players have a higher NVB frequency when they play on a central position than a wide position. Results also show that players have generally a higher NVB frequency when they are ahead and a lower frequency when they are behind. Examining the tactical and emotional NVB, the results illustrate that players become substantially more negative when they are behind, than when they are level or ahead. When a team goes behind the players generally direct their teammates more, try to influence the referee more and ask for the ball less. The findings also showed that home teams become substantially more positive than away teams when they go ahead. However, they also become substantially more negative than the away teams when they go behind. Likewise, teams that win are generally

more positive than the teams that draw when they are ahead. Surprisingly, the teams that lose manages to stay more positive than the teams that win or draw when the teams go behind.

With this study's findings and all the previous knowledge we have on NVB, we can imagine that a football player's NVB can have a considerable impact on their mental state or mindset. We can imagine that a player's NVB before and during performance can affect their expectations of their or others performance and therefore have an impact on how they perform. As we now know more about football players' NVB, it would be beneficial to train the players to control their NVB as it can have an impact on their mental mindset, psychological state and therefore performance.

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# **Appendix**

Appendix A: Registration form to the NSD

Appendix B: NSD Approval

# Appendix A

7/6/22, 11:00 AM

Meldeskjema for behandling av personopplysninger

## NSD NORSK SENTER FOR FORSKNINGSDATA

### Meldeskjema

#### Referansenummer

459744

#### Hvilke personopplysninger skal du behandle?

---

- Navn (også ved signatur/samtykke)
- Bilder eller videoopptak av personer
- Lydopptak av personer

#### Prosjektinformasjon

---

##### Prosjektittel

Kroppsspråk hos fotballspillere i Premier League og FA Women's Super League

##### Prosjektbeskrivelse

Vi skal analysere fotballspillere i de engelske ligaene Premier League og Women's Super League for å undersøke hvordan deres kroppsspråk i en kamp henger sammen med spillerens og lagets prestasjoner i den samme kampen.

##### Begrunn behovet for å behandle personopplysningene

Vi trenger videoopptak av fotballspillerne for å kunne analysere spillernes kroppsspråk, og det vil være mulig å identifisere spillerne gjennom opptakene. I noen av analysene i etterkant av datainnsamling kan det være aktuelt å vurdere våre analyser opp mot variabler slik som spilleres karrierehistorikk, kontraktslengde og prestasjonsnivå i andre kamper. Slik informasjon vil hentes inn fra offentlig tilgjengelige/publiserte databaser og analyser om disse spillerne (det finnes hundrevis av slike kilder). I rapportering av resultater i studentoppgaver og eventuelle artikler vil spillerne være anonyme.

##### Ekstern finansiering

##### Type prosjekt

Studentprosjekt, masterstudium

##### Kontaktinformasjon, student

Thomas Elinam Jenssen, elinam1997@live.no, tlf: +4741003993

##### Behandlingsansvar

<https://meldeskjema.nsd.no/eksport/611cc6be-7667-441e-b476-66085d0560c4>

1/6

**Behandlingsansvarlig institusjon**

Norges idrettshøgskole / Institutt for idrett og samfunnsvitenskap

**Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)**

Geir Jordet, geirj@nih.no, tlf: +4790780250

**Skal behandlingsansvaret deles med andre institusjoner (felles behandlingsansvarlige)?**

Nei

**Utvalg 1****Beskriv utvalget**

Profesjonelle fotballspillere

**Rekruttering eller trekking av utvalget**

Profesjonelle fotballspillere som er i troppen og spiller i et engelsk fotballag i Premier League og FA Women's Super League.

**Alder**

16 - 37

**Personopplysninger for utvalg 1**

- Navn (også ved signatur/samtykke)
- Bilder eller videoopptak av personer
- Lydopptak av personer

**Hvordan samler du inn data fra utvalg 1?****Ikke-deltakende observasjon****Grunnlag for å behandle alminnelige kategorier av personopplysninger**

Allmenn interesse eller offentlig myndighet (art. 6 nr. 1 bokstav e)

**Redegjør for valget av behandlingsgrunnlag**

Prosjektet sikter på å frambringe kunnskap om hvordan fotballspillere på det høyeste nivået i verden (Premier league for menn og Women's super league for kvinner), i verdens største idrett (fotball), kommuniserer nonverbalt i fotballkamper. Fotballkamper på dette nivået har stor offentlig interesse og er allerede gjenstand for grundige analyser av hundrevis av analysefirma/private analytikere som publiserer og offentliggjør sine analyser til fans over hele verden. I tillegg gjør alle impliserte klubber sine egne analyser av både egne og motstanderlagenes spillere, som de så benytter for å skaffe konkurransefordeler for sine lag. Når det gjelder kroppsspråk/nonverbal kommunikasjon i kamp foreligger det per i dag imidlertid helhetlige, omfattende og teoretisk funderte analyser, som gjør at disse delene av en spillers prestasjon enten ignoreres eller feilvurderes som et resultat av grov synsing/fortumtathet. Enkelt sagt betyr dette at man ikke vet noe



om hvordan spillere kommuniserer med hverandre på banen i kamp. Dette gjør at det tas beslutninger om spillere på mangelfullt eller feil grunnlag, som kan ha en rekke negative konsekvenser for enkeltspillere, slik som at spillere rekrutteres på feil grunnlag (man tror en spiller vil passe inn i et lag, men det viser seg at de ikke passer inn ELLER at man ikke tror en spiller vil passe inn, som faktisk ville passet svært godt inn) eller at man ikke er i stand til å coache/utvikle spillere på måten man effektivt kan kommunisere med sine medspillere fordi man ikke har relevante analyser/kunnskap om dette. Samlet gir dette at det vil kunne ha stor allmenn nytte å frambringe kunnskap om dette feltet.

Data til dette prosjektet kommer fra allerede eksisterende videoopptak av offentlige avholdte fotballkamper som av klubbene selv og ikke minst av media allerede granskes i detalj og så vurderes/kommuniseres offentlig. Innhenting av samtykke for å studere og analysere disse allerede eksisterende videoopptakene virker derfor unødvendig. Samtykke er også helt urealistisk (umulig) å forvente gitt at spillere og lag på dette nivået i profesjonell fotball (de to største ligaene på henholdsvis herre- og kvinnesiden) får hundrevis av henvendelser hver eneste uke, og de vil ganske enkelt ikke svare. Dette er også i tråd med publisert policy i ledende idrettsvitenskapelige tidsskrift (i.e., Journal of Sports Sciences) at profesjonelle idrettsutøvere må påregne å gjennomgå en del både tester og analyser som en del av sitt yrke, og at dette unnlates fra normale krav til innhenting av samtykke (Winter & Maughan, i en editorial med tittel: "Requirements for ethics approval", publisert i Journal of Sports Sciences i 2009). Gitt at data om enkeltspillere heller ikke skal offentliggjøres medfører dette prosjektet ingen direkte personulempe for den enkelte spiller, og innhenting av samtykke virker overflødig og dermed lite hensiktsmessig. Hvis vi følger dette betyr det imidlertid at vi må påregne ekstra strenge krav til å ivareta spilleres rettigheter i dette, som blant annet tilsier høye krav til datasikkerhet, sikker kommunikasjon og full konfidensialitet i rapportering av resultater.

Den store majoriteten av spillerne i populasjonen vi skal undersøke er over 18 år (høyst sannsynlig minst 95%, kanskje også 100%). Spillere er imidlertid spilleberettiget i disse to ligaene vi skal analysere ved fylte 16 år, som betyr at det kan forekomme spillere ned til 16 eller 17 år i vårt datamateriale. Det vil være viktig å inkludere disse fordi de er fullverdige medlemmer av de ulike lagene og ved å ta disse vekk vil det gå ut over verdien på analysen av de lagene dette gjelder. Med det sagt vil kravene til datasikkerhet og full konfidensialitet selvsagt også gjelde for disse spillerne, og prosjektet vil ikke medføre noen personulempe for den enkelte spiller.

### **Informasjon for utvalg 1**

#### **Informerer du utvalget om behandlingen av opplysningene?**

Nei

#### **Begrunn hvorfor du ikke informerer utvalget om behandlingen.**

Av samme årsak som skrevet i punktet over (mtp spørsmålet om samtykke) er vi litt usikre på om det er hensiktsmessig å forsøke å informere spillere og lag om et slikt prosjekt, da data til prosjektet kommer fra allerede eksisterende videoopptak av offentlige avholdte fotballkamper som av klubbene selv og ikke minst av media allerede granskes i detalj og så vurderes/kommuniseres offentlig. I tillegg kommer det faktum at profesjonelle idrettsutøvere må påregne å gjennomgå en del både tester og analyser som en del av sitt yrke, som medfører andre informasjons- og samtykkekrav (Winter & Maughan, Journal of Sports Sciences, 2009) OG at vi ikke vil publisere resultater der det er mulig å identifisere enkeltspillere. Til slutt vil størrelsen og populariteten på disse klubbene tilsi at informasjon sendt til spillere sannsynligvis ikke vil tilfalle de aktuelle spillerne.

Vi er derfor innstilt på å ikke sende slik informasjon, men etter dialog med NSD har vi skjønt at prosjektet uansett må gjøres offentlig tilgjengelig på andre måter. Vi har derfor tatt NSD sin anbefaling til følge og gjør informasjonen offentlig tilgjengelig på en egen nettside om prosjektet.

### **Tredjepersoner**

---

**Skal du behandle personopplysninger om tredjepersoner?**

Nei

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**Dokumentasjon**

---

**Hvordan kan de registrerte få innsyn, rettet eller slettet opplysninger om seg selv?**

Hvis vi sender informasjon til klubbene om dette prosjektet kan vi legge til rette for at det er mulig å kontakte veileder/prosjektansvarlig og/eller en av de involverte masterstudenter og dermed vil det bli sendt og vist en oversikt over vedkommende sine personopplysninger som blir behandlet og formålet og hvorfor de blir behandlet.

**Totalt antall registrerte i prosjektet**

100-999

---

**Tillatelser**

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**Skal du innhente følgende godkjenninger eller tillatelser for prosjektet?**

- Annen godkjenning

**Annen godkjenning**

Vi har hatt dialog med "Norges idrettshøgskoles etiske komite" (NIHs interne forskningsetiske organ) om dette prosjektet. Svaret fra dem (ved leder Anne Marte Pensgaard og jurisk Peder Utne) lød: "I og med at dere utelukkende skal studere allerede innsamlede data (videomateriale), så kan ikke jeg se at vilkåret om direkte intervensjon er oppfylt. Videre synes heller ikke prosjektet – av det lille jeg sitter på av opplysning – å ha noen etiske betenkeligheter med hensyn til «betydelig potensiale for skade eller belastning». De konkluderte derfor med at "Prosjektet er IKKE fremleggelsespliktig for NIHs etiske komite."

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**Behandling**

---

**Hvor behandles opplysningene?**

- Ekstern tjeneste eller nettverk (databehandler)
- Mobile enheter tilhørende behandlingsansvarlig institusjon

**Hvem behandler/har tilgang til opplysningene?**

- Prosjektansvarlig
- Student (studentprosjekt)
- Interne medarbeidere
- Andre med tilgang til opplysningene
- Databehandler

**Hvilken databehandler har tilgang til opplysningene?**

Hudl som leverer videoanalyseprogrammet Sportcode vil potensielt ha tilgang til opplysninger.

NSD stilte i sin kommentar til vårt innsendte meldeskjema spørsmål ved om det foreligger en databehandleravtale. Dette foreligger. Vi har vært i kontakt med Hudl om dette punktet, og de gir oss følgende svar, med en link til denne avtalen: "The way we treat your data is outlined in Section 9 of the EULA incorporated into our agreement. You can find it here: [https://www.hudl.com/en\\_gb/eula](https://www.hudl.com/en_gb/eula) Hudl remains compliant with GDPR provisions as outlined in that link above. We have a Data Protection Officer that can be reached for any specific inquiries"

**Andre som har tilgang til opplysningene**

En tidligere student ved NIH, Yaw Amankwah, blir brukt som rådgiver på dette prosjektet og tilfører viktig ekspertise. Han innordner seg imidlertid de samme krav til datasikkerhet, konfidensialitet og etiske retningslinjer som andre studenter som er involvert i prosjektet.

**Tilgjengeliggjøres opplysningene utenfor EU/EØS til en tredjestat eller internasjonal organisasjon?**

Nei

**Sikkerhet**

---

**Oppbevares personopplysningene atskilt fra øvrige data (koblingsnøkkel)?**

Ja

**Hvilke tekniske og fysiske tiltak sikrer personopplysningene?**

- Opplysningene anonymiseres fortløpende

**Varighet**

---

**Prosjektperiode**

15.09.2021 - 30.06.2022

**Skal data med personopplysninger oppbevares utover prosjektperioden?**

Ja, data med personopplysninger oppbevares til: 31.05.2027

**Til hvilket formål skal opplysningene oppbevares?**

Forskning

**Hvor oppbevares opplysningene?**

Internt ved behandlingsansvarlig institusjon

**Vil de registrerte kunne identifiseres (direkte eller indirekte) i oppgave/avhandling/øvrige publikasjoner fra prosjektet?**

Nei

### Tilleggsopplysninger

---

Prosjektet er et studentprosjekt som involverer følgende masterstudenter: Thomas Jenssen, Mariken Kleppe og Malin Knai. I tillegg kommer følgende bachelorstudenter: Joshua Stenersby, Joanna Bækkelund, Marlene Myhrer og Josefine Frøshaug. Alle studentene forventes å skrive studentoppgaver basert på dataene i dette prosjektet.

I forrige spørsmål om varighet og langtidsoppbevaring av data har vi oppgitt at vi vil bevare dataene i 5 år, og dette stilte NSD spørsmål om, der vi eventuelt ble bedt om å begrunne dette. Årsaken er at dette forskningsprosjektet er et første eksplorerende prosjekt i det som kan bli en lang rekke prosjekter framover og hvis resultatene tilsier at dette er et interessant løp å forfølge videre vil vi være interesserte i å se på longitudinelle data knyttet til våre variabler - altså, hvordan forandrer disse spillerens kroppsspråk seg over tid, når de kommer i ulike lag osv. Dette vil være et eget forskningsprosjekt som vi selvsagt vil søke NSD om på nytt for å gjennomføre, men for nå blir det da altså nødvendig å bevare dataene utover den perioden det innværende prosjektet varer.

# Appendix B

[Meldeskjema](#) / [Kroppsspråk hos fotballspillere i Premier League og FA Women's Su...](#) / Vurdering

## Vurdering

Referansenummer	Type	Dato
459744	Standard	29.11.2021

### Prosjekttittel

Kroppsspråk hos fotballspillere i Premier League og FA Women's Super League

### Behandlingsansvarlig institusjon

Norges idrettshøgskole / Institutt for idrett og samfunnsvitenskap

### Prosjektansvarlig

Geir Jordet

### Student

Thomas Elinam Jenssen

### Prosjektperiode

15.09.2021 - 30.06.2022

### Kategorier personopplysninger

Alminnelige

### Rettslig grunnlag

Allmenn interesse eller offentlig myndighet (art. 6 nr. 1 bokstav e)

Behandlingen av personopplysningene kan starte så fremt den gjennomføres som oppgitt i meldeskjemaet. Det rettslige grunnlaget gjelder til 31.05.2027.

[Meldeskjema](#)

### Kommentar

Det er vår vurdering at behandlingen vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet 29.11.2021 med vedlegg, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

### TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 30.06.2022, deretter oppbevares datamaterialet med personopplysninger ved behandlingsansvarlig institusjon med personopplysninger frem til 31.05.2027, med forskningsformål.

### LOVLIG GRUNNLAG

Prosjektet sikter på å frambringe kunnskap om hvordan fotballspillere på det høyeste nivået i verden kommuniserer non-verbalt i verdens største tv-sport. Datamaterialet er tv-sendte fotballkamper som er sett av millioner av mennesker hver eneste uke. Vi vurderer at det er en viss grad av forventet offentlighet med tanke på at spillerne har kjennskap til at kampene blir sett og analysert i ettertid. Prosjektet forsøker å utvide kunnskapen på non-verbale kommunikasjon blant spillerne som kan begrense feiltakelser om spillerne. Vi legger til grunn at prosjektet kan ha stor allmenn nytte for å frembringe ny viten om spillernes kommunikasjon og prestasjoner, samt begrense feiltakelser om spillernes non-verbale kommunikasjon på banen.

Vi legger til grunn til at det blir tilgjengeliggjort offentlig informasjon om prosjektet og hvilke personopplysninger som skal behandles. Varigheten på prosjektet, samt behandlingstiden er relativt kort. I tillegg er det få personer som vil ha tilgang til datamaterialet og sikkerheten er tilstrekkelig. Man vil heller ikke kunne gjenkjenne enkeltpersoner i publikasjonen.

Prosjektet vil behandle overnevnte kategorier av personopplysninger med grunnlag i at oppgaven er nødvendig for å utføre en oppgave i allmennhetens interesse og for formål knyttet til vitenskapelig forskning.

Lovlig grunnlag for behandlingen av alminnelige personopplysninger er dermed at den er nødvendig for å utføre en oppgave i allmennhetens interesse, jf. personvernforordningen art. 6 nr. 1 bokstav e, samt for formål knyttet til vitenskapelig forskning, jf. personopplysningsloven § 8, jf. personvernforordningen art. 6 nr. 3 bokstav b.

Behandlingen er omfattet av nødvendige garantier for å sikre den registrertes rettigheter og friheter, jf. personvernforordningen art. 89 nr. 1.

PERSONVERNPRINSIPPER

1/2

NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen:

- om lovlighet, rettferdighet og åpenhet (art. 5.1 a).
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

#### DE REGISTRERTES RETTIGHETER

Det unntas fra informasjonsplikt etter art. 14 nr. 5 b), der personopplysninger ikke har blitt samlet inn fra den registrerte. Nyten spillerne vil ha av informasjonen om at opplysningene vil bli samlet inn er lav. Samtidig vil det gjøre prosjektet tilnærmet umulig å gjennomføre om individuelt samtykke skulle bli hentet inn. Spillerne får et høyt antall henvendelser i uken som følge av at de er profesjonelle idrettsutøver i en av verdens mest populære idretter, og ville dermed ikke nødvendigvis besvart en henvendelse fra et studentprosjekt. Som et tiltak for å redusere ulempen dette medfører vil det bli gjort offentlig informasjon om prosjektet på egen nettside.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18) og protest (art. 21).

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

#### FØLG DIN INSTITUSJONS RETNINGSLINJER

NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1 f) og sikkerhet (art. 32).

HUDL er databehandler i prosjektet. NSD legger til grunn at behandlingen oppfyller kravene til bruk av databehandler, jf. art 28 og 29.

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

#### MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde: <https://www.nsd.no/personverntjenester/fylle-ut-meldeskjema-for-personopplysninger/melde-endringer-i-meldeskjema>  
Du må vente på svar fra NSD før endringen gjennomføres.

#### OPPFØLGING AV PROSJEKTET

NSD vil følge opp underveis (hvert annet år) og ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet/pågår i tråd med den behandlingen som er dokumentert.

Kontaktperson hos NSD: Olav Rosness, rådgiver.

Lykke til med prosjektet!