

“Hold your Head high”. The influence of emotional versus neutral nonverbal expressions of dominance and submissiveness in baseball

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Previous research has demonstrated that athletes displaying dominant nonverbal behavior (NVB) are perceived to possess more favorable performance characteristics and are expected to perform better than athletes showing submissive NVB. In the present study we used point light videos of a baseball pitcher displaying dominant, submissive, and neutral NVBs to show that this effect is mainly driven by the submissive condition. No difference between the neutral and the dominant condition was evident, suggesting that it is more important to avoid displaying submissive NVB instead of showing dominant NVB as neutral NVB already seems to lead to the impression that the athlete can handle the situation. The results show that NVBs expressing dominance and submissiveness are important early cues that affect the impression formation process in sport and the expectancy of success of the athlete observing this NVB. In addition, the results indicate, that further information about the ability level of the athlete might diminish this effect. Performance consequences of the effect of NVB are discussed.

KEY WORDS: Nonverbal behavior, Person perception, Body language, Self-efficacy, Evolutionary psychology.

Charles Darwin proposed that many behaviors exhibited by animals are demonstrative of evolved adaptations that allow the nonverbal expression of emotions (Darwin, 1872/2009). In the recent past, Darwin's proposal has inspired the theoretical framework, referred to as the “basic emotion” approach (cf. Barrett, 2011). According to the basic emotion view, certain physiological changes underlie the nonverbal expression of a person's emotional state (e.g., fear). A further important tenet of the basic emotion approach is that humans are born with the ability to perceive the emotions expressed by another person. Although there is current debate on the topic

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of whether emotional nonverbal expressions are innate and universally recognized (e.g., see Barrett, 2011; Shariff & Tracy, 2011), the underlying view has been absorbed into other fields of research in psychology.

To date, research in the sports science domain has been broadly aligned with the basic emotion view. Research evidence indicates that the nonverbal expressions of emotions are detected by observers who then expect certain behaviors from an opponent (e.g., Greenlees, Bradley, Holder, & Thelwell, 2005). For example, research by Furley and colleagues (Furley, Dicks, & Memmert, 2012a) demonstrates that football players displaying dominant nonverbal behavior (NVB) prior to penalty kick execution are believed to possess more favorable performance characteristics such as confidence and assertiveness, by opposing goalkeepers in comparison with football players showing submissive NVB. Furthermore, the opposing goalkeepers expected to perform less well against penalty takers displaying dominant NVB. In line with this finding, Furley and colleagues reported that results from an Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998) indicated that dominant NVB is implicitly associated with a positive athlete schema, whereas submissive NVB is implicitly associated with a negative athlete schema (e.g. Fiske & Taylor, 1991; Furley et al., 2012a).

NVB and schema driven person perception. Further to the basic emotion view, current sport person perception research has largely drawn upon schema driven explanations of social cognition, which propose that people use information (e.g., NVB) from early instances of social interaction to classify a person into a certain category or *person schema* (Fiske & Taylor, 1991). Person schemas are defined as an individual's knowledge of attributes of a specific type of person and the relationships among these attributes. Social psychologists have amassed a large body of evidence, which is purported to indicate that social knowledge is utilized during the natural course of perception (for a review, see Ferguson & Bargh, 2004). Such expectations are believed to shape and influence a perceiver's impressions, judgments, feelings, and behavior in relation to others (e.g. Bargh & Chartrand, 1999).

Taken together, schema and basic emotion accounts of person perception (Darwin, 1872/2009; Fiske & Taylor, 1991), offer a potential theoretical framework for studying NVB in sporting situations. For example, this unified framework offers an explanation of why previous person perception research in sport has demonstrated that athletes' impressions are substantially influenced by the observation of NVBs reflecting dominance and submissiveness (Furley et al., 2012a; Greenlees et al., 2008). In line with basic emotion accounts, submissive NVB information may communicate one's acknowledgment of inferiority to the stronger opponent and thereby the

avoidance of potential life threatening attacks (de Waal, 1998). As considered above, such hereditary predisposition implies that humans communicate and interpret nonverbal expressions of dominance and submissiveness as a way of determining status (Mehta, Jones, & Josephs, 2008). In his principle of *Antithesis* Darwin (1872/2009) states that differences between nonverbal emotional expressions emerged due to exaggeration in order to distinctively differentiate between emotions of opposite functioning, such as dominance and submissiveness. Dominance is expressed by an expansive body posture (e.g., widespread limbs and enlargement of occupied space by spreading out) whereas submissive NVB is expressed by a contractive posture (limbs touching the torso) and minimization of occupied space by collapsing the body inward (Carney, Hall, & Smith LeBeau, 2005; Hall, Coats, & Smith LeBeau, 2005; Gifford, 1991).

The Present Research

The rationale of the present study was twofold. First and most importantly, research on the nonverbal expression of emotion has largely ignored neutral expression and mainly focused on dichotomous comparisons such as dominant vs. submissive NVB (Hareli, Shomrat, & Hess, 2009). Hareli and co-workers proposed that the pattern of results when comparing dominant vs. submissive NVBs is mostly driven by submissive NVB, with submissive NVB being responsible for more negative impressions rather than dominant NVB being responsible for more positive impressions. Neutral emotional expressions are believed to be powerful in their own right, as they may reflect relaxation, competence and mastery of the situation (Warner & Shields, 2007). Moreover, showing an emotional reaction to an event could sometimes be considered a weakness (Kopelman, Rosette, & Thompson, 2006). Evidence for this assumption was provided by Lewis (2000) who reported that managers in an organizational setting were perceived as being more competent if they reacted neutrally when receiving bad news. Thus, it seems that behaving neutrally within a situation leads to the impression that the person can handle the situation. To date, the importance of including a neutral emotional expression when investigating dominant and submissive NVB has only been demonstrated for facial expressions, while previous research focusing on body information associated with dominance and submissiveness has only focused on dichotomous comparisons.

The second question we attempted to address in the present study was whether NVB affects the impression formation process when observers view

the NVB during performance preparation in tandem with the observed athlete's action. This comparison has not been made in the literature on the effects of NVB on impression formation in the field of sport. Recently, Freeman and Ambady (2011) have advanced the person perception approach of Fiske and Taylor (1991) by proposing that the process of person construal is dynamic and evolves over time. Freeman and Ambady suggested that following the observation of another person, certain categories or schemas are activated, which then dynamically evolve over time before they stabilize (Freeman & Ambady, 2009; Freeman, Pauker, Apfelbaum, & Ambady, 2010; Kunda, Davies, Adams, & Spencer, 2002). Thus, it was proposed that our impressions of others during the person perception process vary as a function of time, as a certain category can be activated to different degrees (e.g., 0% activation or 100% activation) according to the information that is extracted at a given time (Dale, Kehoe, & Spivey, 2007; Freeman, Ambady, Rule, & Johnson, 2008). In this respect, Freeman and Ambady (2011, p. 249) argued "that person construal involves alternative, competing categories that are simultaneously and partially active, and these evolve over time until stabilizing onto ultimate construal".

In consideration of the *temporal dynamics of person construal* argumentation, in the current study we consider whether the NVB effect on impression formation might be altered if observers obtain further information when viewing opponent's executing baseball pitches. Although, Buscombe and colleagues (Buscombe, Greenlees, Thelwell, Holder & Rimmer, 2006) previously examined the effect of body language and clothing on expectancies of success following the initial observation of the warm-up and subsequent video footage of the target player performing, these authors did not investigate whether the effect of NVB on impression formation differed when analysed in isolation or when followed by further performance relevant information. In order to address this issue, we consider whether watching the target player follow through with the execution of the baseball pitch influences the impression formation of observers. Presentation of the complete throw kinematics of the baseball pitch will provide observers with information concerning the pitching skill of the target, which may be most critical during the impression formation process. In this respect, we attempted to ascertain whether the hypothesized NVB effect is observable to a similar degree when baseball players have additional information about the skill level of the opponent.

To address the aforementioned shortcomings in the literature on NVB and impression formation in sporting contexts, we created point-light videos (Johansson, 1973) of baseball pitchers warming up, which allowed us to

solely manipulate kinematic information pertaining to dominant, submissive, and neutral NVBs, whilst keeping surface features (clothing, hair style, facial features, attire) constant. The point-light technique is ideally suited to investigate the effects of NVBs on impression formation (see Furley et al., 2012a). In this regard, it has been suggested that the pick-up of kinematic information may have evolved for fitness reasons in social animals in order to efficiently communicate emotional information with one another (Bente, Leuschner, Al Issa, & Blascovich, 2010; Blakemore & Decety, 2001). In line with this argument, previous research indicates that accurate person perception judgments are predicated on the information specified by the movement kinematics of the observed actor (Runeson & Frykholm, 1983).

Before actually pitching in the game, baseball pitchers usually warm up by throwing in the bullpen, which is a special area where relief pitchers practice before entering a game. The sport of baseball is therefore a highly suitable scenario as there are specific instances when teammates observe the opposing pitcher warming up. During this warming up period, the opposing team is likely to form an impression of the pitcher. Specifically, previous work on person perception in the domain of sports has demonstrated that preperformance NVB during the warm up has a major impact on an athlete's impression formation, which in turn, influences the expected performance outcome (Greenlees, et al., 2005; Greenlees et al., 2008).

Based on the theoretical considerations outlined above, we hypothesized that the expression of submissive NVB would lead to more negative impression formation and outcome expectation among baseball players compared to both neutral and dominant NVBs. We did not expect to find that the dominant NVB would lead to more positive expressions and outcome expectations compared to neutral NVB. Furthermore, we expected that the effect of NVB on impression formation and outcome expectation would be diminished if observers had further information about the pitching ability of the target as participants had more relevant information available on which they could base their impressions on.

EXPERIMENT

Method

PARTICIPANTS

Male baseball players ($n = 40$; $M = 27.5$; $SD = 2.9$) took part in the study, who had been playing for an average of 9 years at an amateur level in Germany. Neither age, nor playing

level, nor years of playing experience significantly moderated the results. Informed consent was obtained from every participant before commencing the experiment. The study was carried out in accordance with the Helsinki Declaration of 1975.

STIMULI

The filming took place at night on a regular baseball field in order to eliminate almost all ambient light. We used a third person, side-on filming perspective so as to depict the perspective baseball players have when observing an opposing pitcher warming up in the bullpen (see figure 1). All footage was filmed with a Canon HG21 digital video camera mounted on a tripod, placed 8 m from the pitcher at a height of 1.85 m. Two halogen spotlights, mounted on a tripod, were positioned in front of the camera directed at the actor.

We recruited 4 actors who all wore black tight fitting clothes and headwear. Reflective tape was placed on the clothes (cf. figure 1) following the procedure of Atkinson, Dittrich, Gemmell, and Young (2004). We placed 2-cm-wide stripes of reflective tape around each

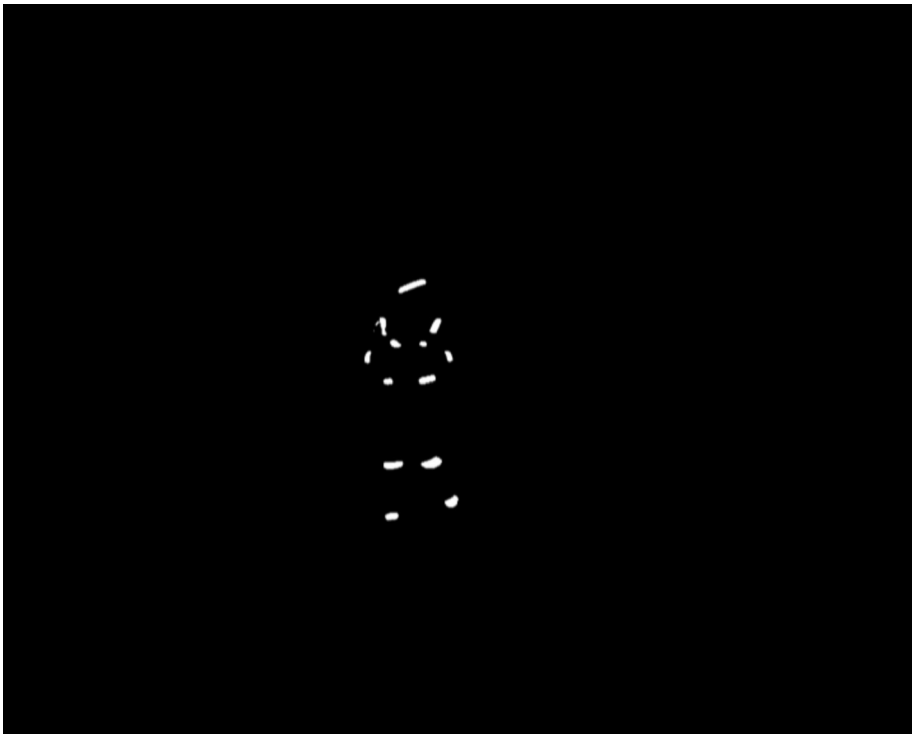


Fig. 1. - Single frame of a sample pointlight stimuli of a player showing a neutral body language used in Experiment 1.

ankle, knee, elbow, shoulder, hip and hand. Furthermore, we placed one strip as a headband around the head. The ankle, knee, elbow, and hand tapes completely encircled the limb. The reason we choose strips over points of light was that these are better visible from different angles and thereby allow the actors more freedom of movement without the reflection disappearing when creating the point-light videos (Atkinson et al., 2004).

NVB manipulation

All of the actors received the same instructions on how to prepare the pitch and were asked to carry out two different versions of a pitch: a wind up pitch and a set pitch. This combination ensures that the player is visible both from the side and from the front and therefore allows full visibility of the NVB displayed by the respective pitcher. The set and the wind-up conditions are the two legal pitching actions in baseball (Footnote). The wind-up is characterized by a *slower* prepitch movement, during which, the pitcher is visible both from the frontal and side perspective. The set position is characterized by a *faster* prepitch execution, during which, the pitcher is only visible from a side-on perspective. Our experimental manipulation involved the NVB of the baseball players before they enter the game and was derived from the experimental manipulations used by Greenlees et al (2005) and Carney et al. (2005). During the follow through of the pitch execution, the actors were instructed to behave as per their standard warm-up. In the positive, dominant NVB condition, the actors were asked to (i) stand and walk with an erect posture, which involved pulling the shoulders back and pushing the chest out; (ii) slightly spread the limbs from the torso in order to occupy more space; (iii) hold the head up with the chin parallel to the ground so that their eyes were looking directly at the camera; and (iv) to look directly at the camera for 90% of the time. For the submissive NVB condition, the actors were asked to (i) adopt a slouched posture with the head and chin pointing down; (ii) limbs touching the torso and thereby minimizing the occupied space by collapsing the body inwards; (iii) shoulders hanging to the front; and (iv) the eyes looking down for 90% of time and only briefly glancing at the goal-keeper/camera. In the neutral condition we asked participants to show the NVB they adopt when they casually warm up. Specifically, the neutral NVB condition involved the actors to (i) adopt a relaxed stance with the feet shoulder-width apart and the shoulders casually hanging; (ii) neither collapse the limbs inward or outward (iii) not to deliberately hold the head up and the chin slightly pointed towards the ground; (iv) to gaze in the direction of the opposing hitter for approximately 50% of the time.

Every actor was filmed six times in the three different NVB conditions, three times for every NVB in the windup condition and three times for every NVB in the set condition. Two independent raters selected those videos that were — except for the experimental manipulation — most similar to one another. The raters evaluated the footage from the three experimental conditions across three seven point Likert scales—ranging from not at all dominant (1) to highly dominant (7); not at all submissive (1) to highly submissive (7); and not at all neutral (1) to highly neutral (7). The evaluations of the raters in the dominant and submissive conditions are comparable to those reported in previous research (Furley et al., 2012a): dominant condition (dominant scale $M = 5.8$; submissive scale $M = 0.6$; neutral scale $M = 2.6$); submissive condition (dominant scale $M = 0.4$; submissive scale $M = 5.6$; neutral scale $M = 1.6$); and

(Footnote) Without going into exact detail of the respective pitching positions we only detail the important differences between them for the study. More detailed descriptions of the respective pitching positions can be obtained in Dun, Kingsley, Fleisig, Loftice, and Andrews (2007).

neutral condition (dominant scale $M = 3.9$; submissive scale $M = 2.3$; neutral scale $M = 4.9$). The procedure to evaluate the experimental footage ensured that the 24 videos — four actors filmed in 3 different NVB conditions and the 2 pitch conditions (windup and set) — used as the experimental stimuli only significantly differed due to the experimental manipulation. As the data set obtained showed almost the exact same pattern of results for the windup and the set pitches, we did not treat this as an experimental factor.

Available information manipulation.

The second experimental factor was varied between subjects and involved the length of the point light videos. In the short condition, participants viewed the preparation of the pitch and the video stopped three frames before the ball was released. In the long condition, participants viewed the exact same videos, only this time the whole pitch was visible.

MEASURES

Following previous sport person perception research (e.g., Greenlees, et al., 2008; Greenlees, 2006; Greenlees et al., 2005), participants rated the player on several 11 point digital semantic differential scales after every video. In order to give their ratings, participants moved a mouse cursor from the middle of the scale towards either pole of the scale and log in their rating by clicking the left mouse button. The software transformed the ratings into a value (with 3 decimals) between 0 reflecting the left pole of the scale and 1 reflecting the right pole of the scale. The utilized scales were continuous, ranging from 0.000 to 1.000 and were visually presented as 11 points in order to assist participants in providing a clear indication of their ratings. All of the following measures were adapted computerized versions of measures used in previous literature (Furley et al., 2012a; Greenlees et al., 2008).

Perception of target player

The first seven items were taken as measures concerning the perceived impressions towards the target baseball pitcher. The dimensions were: assertive – not assertive; competitive – non-competitive; and experienced – novice; confident – unconfident; composed – on edge; focused – not focused; and relaxed – tense. Scores for each scale were summed to give a measure of the impression formed to the target player (from 0 to 7) with low scores indicating less positive impressions.

Quality of pitch

We asked participants to rate the quality of the pitch (or expected quality of the pitch in the short condition) along the dimensions very low quality – very high quality with low scores reflecting low quality pitches. The scores potentially ranged from 0 to 1.

Speed of pitch. We asked participants to rate the speed (or expected speed of the pitch in the short condition) along the dimensions very slow – very fast with low scores reflecting slow pitches. The scores potentially ranged from 0 to 1.

Outcome expectancy

The last three items assessed how sure participants were that one out of three; two out of three; and three out of three pitches would be a strike (a pitch within the strike zone that they did not hit or a pitch within the strike zone that they did not swing at). Furthermore, a fourth item assessed how sure the observers were that they would be struck out by that pitch. A strikeout in baseball occurs after a batter has three strikes. All of these scales have an element of expected performance of the opponent — a pitch within a specified zone around the batter—and an element of confidence of the participant — “will I be able to hit the ball”. We therefore consider it appropriate to combine these four scales to one outcome expectancy measure, which was computed from the four items — every single score was multiplied by the amount of expected strikes in the question and added together at the end. The last item assessing the likelihood of a strikeout was therefore also multiplied by three. This was done so that a higher certainty of three strikes would have a greater weight than one strike — reflecting the outcome expectations of the participants (based on the recommendations of Greenlees et. al. 2007; Feltz & Chase, 1998 for the measurement of competitive expectancies). The scores potentially ranged from 0.000-9.000. Hence, if a participant rated the likelihood of one strike out of three as 0.9, the likelihood of two strikes out of three as 0.7, the likelihood of three strikes out of three as 0.4, and finally the likelihood of being struck out was 0.5. The equation for the calculation of such outcome expectancy score is as follows: $(0.9*1)+(0.7*2)+(0.4*3)+(0.5*3)=5$.

PROCEDURE

Participants were instructed that they had to rate baseball players solely on the kinematic information that was presented to them in the point light displays. Before commencing the experiment, participants filled out a questionnaire gathering demographic data. Every participant was tested individually on a standard 17 inch notebook. E-prime 2.0 professional (Psychological software tools, 2007) was used to present the stimuli and collect the judgments on a 19 inch computer screen placed 60 cm away from the subjects. Every participant viewed all of the 24 videos in random order. Participants first performed two practice trials to familiarize themselves with the procedure. After this, the 24 clips were presented in a random order and participants had to give their ratings by clicking the left mouse button on the various scales described above. After completing the testing procedure, participants were informed about the purpose of the experiment.

DATA ANALYSIS

We calculated a mixed design MANOVA with repeated measures on the within subject independent variable NVB (dominant, neutral, and submissive) and the between subject independent variable video length (short vs. long) in which the separate dependant variables were treated as a general index of the overall impression formed of the target player. We followed up the MANOVA with a series of equivalent univariate ANOVAs to examine the effect on the single dependant variables of player perception, outcome expectation, perceived pitching quality and speed (cf. Greenlees et al., 2008). Where the assumption of sphericity was violated, the p-values were computed using the conservative Greenhouse-Geisser method with

corrected degrees of freedom. Furthermore, to assess the effects of the separate items of the perception of target player scale, we calculated an additional MANOVA with repeated measures on the within subject independent variable NVB (dominant, neutral, and submissive) on the individual perception of target player dependant variables.

Results

The cronbach alpha coefficient for the person perception scale was more than satisfactory ($\alpha=.93$). The descriptive statistics are summarized in Table II. The 3 (dominant, neutral, and submissive) \times 2 (short vs. long) MANOVA using Pillai's trace revealed a significant main effect of NVB on overall impression formation ($V = .408$; $F(8, 31) = 2.671, p = .023, \eta^2 = .408$) demonstrating that the preperformance NVB had an impact on the participant's ratings. Further, a significant main effect of video length was evident on overall impression formation ($V = .265$; $F(4, 35) = 3.149, p = .026, \eta^2 = .265$), indicating that participants formed more positive impressions of the baseball players when they only watched them prepare the pitch and not actually carry it out. The interaction between NVB and video length failed to reach significance ($V = .308$; $F(8, 31) = 1.724, p = .132, \eta^2 = .308$), indicating that the effect of NVB were maintained, even when participants viewed the whole of the pitching action, although there was a trend towards a more pronounced effect of NVB when participants did not view the whole pitching action.

Follow-up ANOVA on perception of the target player revealed a main effect of NVB ($F(1.676, 63.702) = 7.736, p = .001, \eta^2 = .169$). Bonferroni corrected pairwise comparisons revealed that this main effect was driven by the submissive NVB condition which significantly differed from both the neutral and dominant condition ($p = .011$). There was no difference between the dominant and the neutral condition ($p = 1$). No significant main effect was

TABLE I
Players's Mean Ratings Of Pitchers As A Function Of Body Language And Video Length

	Condition											
	dominant body language				neutral body language				submissive body language			
	<-long		short->		<-long		short->		<-long		short->	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Perception of target	4.13	.68	4.14	.66	3.89	.61	4.40	.77	3.75	.56	3.81	.54
Outcome expectancy	4.95	1.2	4.75	1.3	4.75	.96	5.08	1.3	4.30	.79	4.46	1.27
Pitch quality	.60	.15	.61	.02	.61	.16	.59	.16	.63	.13	.61	.15
Pitch speed	.56	.11	.61	.08	.52	.09	.62	.11	.48	.08	.57	.11

evident for the between subject factor video length ($p = .235$). The interaction between NVB and video length was significant ($F(1.676, 63.702) = 3.337, p = .05, \eta^2 = .081$), indicating that the effect of NVB was stronger when participants only saw the athlete prepare the pitch instead of actually carrying it out. Bonferroni corrected pairwise comparisons revealed significant differences in the short video condition between the submissive and both the neutral ($p = .005$) and dominant condition ($p = .032$), but not between the dominant and neutral condition ($p = .105$). No significant differences were evident in the long video condition (submissive/neutral $p = 1$; submissive/dominant $p = .21$; dominant/neutral $p = .128$). Table 2 summarizes the individual effects of the NVB manipulation on the player rating scales. MANOVA using Pillai's trace on the individual perception of target player items revealed a significant main effect of NVB on overall impression formation ($V = .476; F(14, 26) = 3.377, p = .004, \eta^2 = .645$). Results in Table 2 indicate that this effect was driven by the scales: assertive – not assertive; confident – unconfident; composed – on edge; and relaxed – tense.

The ANOVA on the expected pitching success of the player revealed a main effect of NVB ($F(2, 76) = 8.463, p = .001, \eta^2 = .182$). Bonferroni corrected pairwise comparisons demonstrated that this main effect was driven by the submissive NVB condition differing significantly from both the neutral ($p = .004$) and dominant condition ($p = .007$). No other main effects or interactions reached significance. No main effects or interactions were evident on the expected quality of the pitch. However, the follow up ANOVA on expected speed of the pitch revealed a main effect for NVB ($F(1.715, 65.184) = 5.461, p = .009, \eta^2 = .126$). This effect was driven by the submissive condition. Bonferroni corrected pairwise comparisons only revealed a significant difference between the submissive NVB condition and dominant condition ($p = .009$), whereas the difference to the neutral condition only approached significance ($p = .125$). Furthermore, only the between subject

TABLE II
Univariate Analysis For The Main Effects Of NVB On The Individual "Perception Of Target Player"
Dependant Variables

Item	M (SD) dominant	M (SD) neutral	M (SD) submissive	df (model, error)	F	η^2	p
assertive – not assertive	.59 (.09)	.59 (.09)	.56 (.08)	1,689, 65,881	5,353	0.121	.010
competitive – non-competitive	.60 (.09)	.59 (.10)	.57 (.09)	2, 78	1,741	0.043	.182
experienced – novice	.57 (.09)	.57 (.09)	.55 (.08)	2, 78	1,199	0.030	.307
confident – unconfident	.62 (.10)	.60 (.09)	.57 (.10)	1,520, 59,284	4,110	0.095	.031
composed – on edge	.52 (.10)	.56 (.09)	.53 (.10)	2, 78	4,401	0.101	.015
focused – not focused	.62 (.10)	.60 (.09)	.57 (.10)	1,678, 65,442	1,020	0.025	.365
relaxed – tense	.51 (.10)	.55 (.09)	.53 (.10)	2, 78	4,028	0.094	.022

main effect of video length was significant ($F(1, 38) = 12.650, p = .001, \eta^2 = .250$), indicating that subjects expected the speed of the pitch to be higher when they only saw the player preparing the pitch compared to following through with the pitch. This univariate effect therefore seems to be the sole reason for the significant effect in the initial MANOVA.

Discussion

The aim of the study was to advance previous person perception work in the field of sport by including a neutral NVB condition as most research on the nonverbal expression of emotion has largely ignored neutral expression and mainly focused on dichotomous comparisons such as dominant vs. submissive NVB (Hareli, Shomrat, & Hess, 2009). Secondly we attempted to address a further shortcoming in the person perception literature in sports by investigating whether NVB affects the impression formation process similarly when observers view the NVB during performance preparation in tandem with the observed athlete's action.

We were able to replicate previous results on the effects of NVB signaling dominance and submissiveness on impression formation and outcome expectation in the sport of baseball. The results of the present study are in line with evolutionary accounts of dominant and submissive NVBs and suggest that these influence the impressions and the expected success of opponents competing against athletes displaying these NVBs. The most interesting and unique finding of the present study was that the effect on impression formation was largely driven by submissive NVB as only this condition differed significantly from the neutral and the dominant conditions. The dominant and neutral NVB conditions led to similar impression formation and outcome expectancy scores. In this respect, acting in a neutral manner while preparing a baseball pitch might be perceived as a sign of relaxedness, competence and mastery of the situation (Warner & Shields, 2007). From a practical perspective, it therefore seems more important to avoid displaying submissive NVB instead of showing a dominant NVB as a neutral NVB already seems to lead to the impression that the athlete can handle the situation.

Results of the multivariate analysis did not reveal a significant interaction for NVB and video length on overall ratings. We only found tentative support for our prediction that NVB would have a greater effect on impression formation when participants had less information (short condition) about the quality of the actual pitch compared to a condition in which participants viewed both the preparation and follow through of the baseball pitch. Only

the univariate analysis on the person perception scale showed this significant interaction but did not generalize to the expected outcome measures. Thus, the NVBs of athletes seem to have an impact, if participants have additional information about the pitching ability of the opponent. However, the results do indicate that the effect of NVB on the impressions formed of the athlete is not as pronounced when participants view the actual pitching action of the athlete as shown by the significant univariate interaction between NVB and video length on the person perception scale. This might be interpreted as indicative of the assumption that further important information about the pitching ability of the athlete modifies the initial athlete schema that is activated.

The interpretation outlined above follows Freeman and Ambady's (2011) temporal dynamics argumentation of person construal, which proposes that certain expectations of an opponent dynamically evolve over time before they stabilize (Freeman & Ambady, 2009; Freeman, Pauker, Apfelbaum, & Ambady, 2010; Kunda, Davies, Adams, & Spencer, 2002). Previous research suggests that preperformance NVBs activate certain athlete schemas, affecting impression formation and expected performance of opposing athletes (Furley et al., 2012a). Taking this into consideration with the present results, it appears that NVBs activate a certain athlete schema at an early stage in the impression formation process. The initial impression is then likely to be integrated with further information later on in the impression formation process "until stabilizing onto [the] ultimate construal" (Freeman & Ambady, 2011, p. 249). In this respect, impression formation in the field of sport may be best understood as a gradual time-dependant transition between different person schemas as people exploit information across different timescales. For example, an athlete may already have an initial expectation of an opponent based on pre-game analysis, which may alter when observing the same opponent displaying dominant or neutral NVBs during the warm up. This may then lead the athlete to believe that the opponent is likely to be highly skilled and the chances of performing successfully against him are not very high. In consideration of the present results, we suggest that NVB may act as an important information source that is readily interpreted by opponents (especially, if limited further information is available about the athlete), as the person perception process in sport is usually highly time constrained.

Although the results may be interpreted in this manner, it is important to acknowledge that the present design made sure that no other information could be integrated and therefore the NVB effect might have been exaggerated compared to the actual effects of NVB in the field. As considered, dur-

ing sport competitions, the impression formation process is likely to be affected by multiple interacting factors including previous knowledge of the opponent's ability level and additional information gathered during the warm-up or at different instances of a competition. Pertinent to the present results, Kahneman (2011) argues that people in general do not acknowledge that they might be missing important information when forming impressions of other people. Instead, they tend to treat the limited information available as if it were all there is to know which Kahneman explains with reference to his WYSIATI ("What you see is all there is") rule. Rather than drawing upon or seeking further information before forming an impression of another person, Kahneman proposed that "You build the best possible story from the information available to you, and if it is a good story, you believe it. [...] Our comforting conviction that the world makes sense rests on a secure foundation: our almost unlimited ability to ignore our ignorance" (Kahneman, 2011, p. 201). Following this line of argument, it would appear that the participants in the experiment formed an impression solely on the basis of the NVB in the short video condition as there was hardly any other information available. Therefore, rather than acknowledging their ignorance in the experiment, participants build up a story that made sense based on highly limited information. When they had slightly more information available in the long video condition, then the effect of NVB on impression formation was not as pronounced. Hence, it is important to acknowledge that the present study was conducted in an artificial laboratory situation with substantial differences to the demands of competitive sports as athletes usually have a lot more information to integrate and therefore it is likely that NVB has a smaller effect in the field, which is tentatively supported by the comparison of the short and long videos. Therefore, future research on NVB in sports has to advance to more representative sport performance context and for example start to investigate how NVB based impression formation influences behavior (see Furley, Dicks, Stendtke, & Memmert, 2012b).

Nevertheless, research suggests that preperformance NVB influences first impressions even when further performance relevant information is presented (Buscombe et al., 2006). Following suggestions of the evolutionary significance of dominant and submissive behaviors (Mehta et al., 2008), the present results clearly show that athletes are well advised to avoid the display of submissive NVB. Recent research linking performance and NVB suggests that following competitive success, participants display dominant NVB, which coincides with an increase in testosterone levels and a decrease in cortisol (Mazur & Booth, 1998; Mehta & Josephs, 2010; Mehta et al., 2008). In contrast, losing in competition has the opposite effects (Mehta et al., 2008).

That is, decreases in testosterone levels and increases in cortisol level, coinciding with the display of submissive NVB (Archer, 2006). When athletes are losing in a prolonged competition, potentially leading to the display of submissive NVB, then the present results suggest that this in turn leads to enhanced confidence of the opponent, which is likely to result in further performance advantages for the opponent. As we did not assess actual sporting performance, the implications of the present study on sporting performance are not clear and future research should address this limitation. In this regard, Furley et al. (2012b) who demonstrated that goalkeepers adapt their penalty saving strategy by initiating their movement later as a consequence of observing NVB during the penalty preparation that signals high levels of anxiety. Nevertheless, in consideration of previous work, it is plausible that the pattern of results obtained here might have considerable influence on an athlete's performance in sport. For example, the observation of specific NVBs such as dominance or submissiveness may, in turn, influence the perceived competence of the batter in successfully competing against the pitcher, and thus influence their performance since evidence from self-efficacy theory (Bandura, 2001 for a recent review) demonstrates that outcome expectancy beliefs can potentially influence performance in sport settings (Feltz, Short, & Sullivan, 2008). In support of this argumentation, a recent study by Damisch, Stoberock, and Mussweiler (2010) demonstrated that self-efficacy beliefs can even turn seemingly irrational beliefs — superstitious talisman — into observable performance benefits in a golf putting task by increasing people's beliefs in their abilities.

In conclusion, the present study adds to the growing body of research on person perception in sport by demonstrating that the NVB affects on impression formation using dichotomous NVB manipulations — positive vs. negative or dominant vs. submissive — are mainly driven by the negative or submissive conditions as the additional neutral condition was almost the same as the dominant condition. In addition, we provided first tentative evidence that additional performance related information decreases the affect of NVB on impression formation. It is our hope that future research on person perception in sport builds on this first observation.

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