"I'm Pretty Sure That We Will Win!": The Influence of Score-Related Nonverbal Behavioral Changes on the Confidence in Winning a Basketball Game

Philip Furley[1] and Geoffrey Schweizer[2]

[1]German Sport University Cologne; [2]University of Heidelberg

The goal of the present research was to test whether score-related changes in opponents' nonverbal behavior influence athletes' confidence in beating their opponents. In an experiment, 40 participants who were experienced basketball players watched brief video clips depicting athletes' nonverbal behavior. Video clips were not artificially created, but showed naturally occurring behavior. Participants indicated how confident they were in beating the presented athletes in a hypothetical scenario. Results indicated that participants' confidence estimations were influenced by opponents' score-related nonverbal behavior. Participants were less confident about beating a leading team and more confident about beating a trailing team, although they were unaware of the actual score during the depicted scenes. The present research is the first to show that in-game variations of naturally occurring nonverbal behavior can influence athletes' confidence. This finding highlights the importance of research into nonverbal behavior in sports, particularly in relation to athletes' confidence.

Keywords: person perception, thin slices, evolution, social cognition

"I always look at the person and then if they look away straight away that's one up for me, it's a psychological boost, they've fallen, they can't handle it so it's one up. If you walk out with your head down then you just know that that person's not up for it" (Hays, Thomas, Maynard, & Bawden, 2009, p. 1192). This quote by a world champion athlete highlights the core theme of the present research: the interdependence between the perception of an opponent's nonverbal behavior (NVB) and another athlete's level of confidence in beating that athlete.

Previous research (Furley & Dicks, 2012; Furley, Dicks, & Memmert, 2012; Greenlees, Bradley, Thelwell, & Holder, 2005; Greenlees, Buscombe, Thelwell, Holder, & Rimmer, 2005) has provided evidence that preperformance NVB of opponents has an influence on the confidence of athletes in themselves to compete successfully against these opponents. These findings are in line with the frequent statement in the literature (Vealey & Chase, 2008) that sporting confidence is highly sensitive to situational fluctuations. This statement is supported by both empirical evidence from interview

studies (e.g., Eklund, 1994; Hays et al., 2009) and anecdotes, as for example by National Football League Hall of Fame member Joe Montana: "Confidence is a fragile thing" (Vealey & Chase, 2008, p. 66). A limitation of previous research on the influence of NVB on confidence has been that it has exclusively used actors displaying exaggerated forms of preperformance NVB. However, it remains unclear whether naturally occurring NVB during the game has a similar influence on confidence levels in competing athletes.

Of particular importance for the present research, Furley and Schweizer (2013) demonstrated that athletes change their NVB as a consequence of leading or trailing in an ongoing competition and that these score-induced NVB changes were accurately interpreted by observers as signs of leading and trailing. These findings can be understood based on evolutionary accounts of NVB (see Shariff & Tracy, 2011 for a recent review), arguing that NVB changes can be considered fitness-enhancing adaptations. In this respect, primates have shown to send submissive nonverbal cues when losing a fight to avoid further potentially life-threatening attacks (de Waal, 1998). On the other hand, winning a fight leads primates to show dominant NVB. These NVB are also believed to be adaptive, as they communicate superiority over the opponent and thereby can also save valuable resources by preventing further aggressive encounters (Archer, 2006; de Waal, 1998; Mehta & Josephs, 2010). Hence, it seems plausible that athletes' confidence levels in beating an opponent are influenced

Philip Furley is with the Institute of Cognitive and Team/Racket Sport Research, German Sport University Cologne, Köln, Germany. Geoffrey Schweizer is with the Department of Sport and Exercise Psychology, University of Heidelberg, Heidelberg, Germany. Address author correspondence to Philip Furley at p.furley@dshs-koeln.de.

by score-induced NVB changes among opponents due to our evolutionary inheritance.

Although most research on confidence in sport has used Bandura's (1997) self-efficacy framework as underlying theory, we use Vealey and Chase's (2008) conceptualization of sport confidence because it is better suited to explain short-term fluctuations in athletes' beliefs in beating their opponents, as it has specifically been developed for the sport context. In this respect, Vealey and Chase stated that an athlete gains or loses confidence via the following sources: mastery, demonstration of ability, physical and mental preparation, physical self-presentation, social support, vicarious experience, coach's leadership, environmental comfort, and situational favorableness. The last two sources would entail how the perceptions of an opponent's NVB have the potential to either increase or decrease athletes' levels of confidence.

As levels of confidence have been cited as one of the most important factors affecting sport performance (e.g., Feltz, 1988), it is important to investigate whether score-induced NVB changes among opponents are one of the factors influencing confidence levels of athletes during competition. Therefore, we use the thin slices of expressive behavior approach (Weisbuch & Ambady, 2010) to experimentally test whether basketball players' belief in beating an opponent varies when viewing short video recordings of an opponent's NVB. Research using the thin-slices approach has presented substantial evidence that humans can correctly infer various outcomes (e.g., personality characteristics, teaching effectiveness, criminal behavior) from watching very short displays of (nonverbal) behavior (Weisbuch & Ambady, 2010). These short displays are called thin slices. In this endeavor, we used the same stimulus material as in Furley and Schweizer (2013) who were able to show that people could accurately interpret who was leading or trailing based on NVB of basketball players. Thus we further remedy a shortcoming of previous research on NVB and confidence by using naturally occurring NVB displays during competition instead of artificially created preperformance displays.

Method

Participants

Forty male basketball athletes (M_{age} = 26.70, SD = 5.14) who were recruited by contacting local basketball teams via e-mail and telephone took part in the study. Their average playing experience was 14.3 years (SD = 4.9) at an amateur to semiprofessional level in Germany. The athletes reported spending an average of 4.5 hr/week (SD = 4.9) watching televised coverage of basketball. None of these variables significantly influenced the pattern of results. Written 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

We used the basketball stimuli from Furley and Schweizer (Experiments 1 and 2, 2013). Accordingly, the following descriptions of stimulus selection and measures are highly similar to the ones in Furley and Schweizer (2013). We selected video footage of televised basketball games from the NBA and the top German league (Seasons 2010–2012). To ensure that the ratings were not influenced by score-induced changes in sport-specific behavior such as tactics, we chose video stimuli that involved breaks during the game (e.g., timeouts and free throws). We did not select videos showing obvious nonverbal signals associated with pride or shame, such as raising both fists above the head or hiding the face behind the hands (cf. Tracy & Matsumoto, 2008), which have empirically been linked to the final outcome in sport and therefore would be overinformative cues for estimating the score. Selected videos had a mean duration of 3.9 s (SD = 2.8; Mode = 1).

Experimental Manipulation

The manipulation in the study was based on the actual score of the game during the video. We chose five different categories of scores: (a) far behind, showing a team trailing substantially, which was defined as at least fifteen points behind—moreover, in this category, the team shown always lost the game in the end; (b) close behind, showing a team losing in a fairly close game situation, which was defined as no more than five points behind; (c) a draw, in which the score was equal; (d) close lead, showing a team leading in a fairly close game situation, which was defined as no more than five points ahead; (e) high lead, displaying a team leading substantially, which was defined as at least 15 points ahead—moreover, in this category, the team shown always won the game in the end.

We aimed at having a battery of 20 videos in each experimental category (100 video clips in total). The selection of videos was done by student research assistants according to the following guidelines. Research assistants were instructed to review all videos of a convenience sample of 30 basketball games one after the other. They were to select each video that fitted the aforementioned criteria (breaks during game, no obvious nonverbal signals that have empirically been linked to victory and defeat [Tracy & Matsumoto, 2008]), until each category of scores contained 20 videos. To maximize transparency, we provide hyperlinks to the stimulus material used in the studies. Note that the software randomly selected and displayed the stimulus material and was not displayed as shown in the video stream (http://www.youtube.com/watch?edit=vd&v=UsviKNsOkUM). It is important to mention that the test material was not deliberately selected to fit the descriptions of dominant versus submissive or proud versus shameful NVB. It was originally selected to answer the question of whether perceivers can infer the actual score from score-related changes in athletes' NVB (Furley & Schweizer, 2013).

Measure

In line with Tenenbaum, Kamata, and Hayashi (2007), we used a one-item measure of self-confidence. Subsequent to every video presentation, participants rated how confident they were about winning the game against the athlete or team shown when assuming the role of an opponent player. Perceivers gave their ratings on an 11-point digital semantic differential scale with the poles *not at all confident* and *very confident*. To give their ratings, perceivers moved a mouse cursor from the middle of the scale toward either pole and logged in their rating by clicking the left mouse button. The software converted the ratings into a value (with three decimals) between 0, reflecting the left pole of the scale with the label *not at all confident*, and 1, reflecting the right pole of the scale with the label *very confident*. The used scale was continuous, ranging from 0.000 to 1.000 and was visually presented as 11 points to assist participants in providing a clear indication of their ratings.

Procedure

Perceivers were instructed that they had to assume the role of a player of the opposing team and estimate—based on the behavior of the opponent in the film clip—how confident they were about beating the opponent by moving a mouse cursor to either the *not at all confident* or *very confident* pole of the semantic differential scale. Further, they were told to assume that their basketball abilities were at the same level as those of the players/teams presented in the stimulus material. The remaining procedure was identical to Furley and Schweizer (2013). Participants were further instructed to answer as accurately as possible, while speed was not emphasized. E-prime 2.0 professional (Psychological software tools, 2007) was used to present the stimuli and collect the estimations. All videos were presented silently to ensure that ratings were based on NVB and not, for example, crowd noise. For every perceiver, the software randomly chose 12 videos from the categories far behind and high lead. For the other three categories (close behind, draw, and close lead), only four videos were randomly chosen so that 12 videos were also presented for the combined category, close score. Hence, every perceiver viewed 36 videos out of the 100 video clip battery in random order. In other words, different perceivers were randomly assigned to different sets of videos. This approach was intended to ensure that results do not depend on specific combinations of stimuli. After every video clip, perceivers had to give their rating by clicking the left mouse button on the score estimation scale described earlier. After completing the testing procedure, perceivers filled out a questionnaire gathering demographic data and were informed about the purpose of the experiment.

Results

The descriptive results of Experiment 1 are displayed in Figure 1. A 1×5 (score category [far behind, close behind, draw, close lead, and high lead]) repeated-measure univariate ANOVA revealed a significant main effect of score category on perceivers' confidence estimations, $F(4, 156) = 11.03$, $p < .001$, $\eta^2_p = .220$, indicating that perceivers were receptive to subtle NVB changes that are associated with the current score of the game (Furley & Schweizer, 2013) and used this information in estimating their chances of beating the target team. The higher the depicted athletes were trailing in the game, the more confident perceivers were that they would be able to beat the athletes shown in the respective video. A follow-up polynomial linear contrast analysis revealed a strong linear relationship between score category and confidence estimates, $F(1, 39) = 59.318$, $p < .001$, $\eta^2_p = .603$, meaning that confidence estimates corresponded in an inverse linear manner to the actual score categories (Figure 1). Furthermore, perceivers exhibited self-enhancing tendencies in the manner of the better-than-average effect or the optimistic bias (Alicke & Govorun, 2005): In all score categories, perceivers' average confidence in beating the opponent did not fall into the lower half of the scale—except minimally in the high lead category. In other words, participants never really expected to lose the match, even when the opponent showed dominant NVB as a consequence of leading by far.

Discussion

The aim of this study was to investigate whether score-related changes in NVB of opponent athletes influenced confidence levels in basketball players of beating the observed athletes. In accordance with Clark-Carter (1997), who suggested that η^2_p values above 0.138 may be classified as large effects, the main effect of actual score on the confidence beliefs $\eta^2_p = .220$ ($\eta^2_p = .603$ for the linear contrast analysis) represents a large statistical effect. Hence, the present research extends previous findings, showing that people are not only well-equipped to pick up and interpret subtle NVB changes that occur during gameplay (Furley & Schweizer, 2013), but more importantly that they use this information to inform anticipated interaction with the target athlete—in this case, how confident they were in beating the opponent. The finding that perceivers displayed a tendency for self-enhancement, which is commonly found in research on confidence, suggests that changes in the dependent variable indeed reflect variations in confidence, and not for example variations in judgments whether the opponent is currently leading or trailing (cf. Furley & Schweizer, 2013). Although the effect size based on our measure of confidence may be regarded as large by statistical convention, it is impossible to deduce from this effect size how strongly NVB affects confidence in a real-world competition. We propose that the real-world effect of NVB on confidence in different situations varies depending on the presence of other factors related to confidence (Hays et al., 2009; Vealey & Chase, 2008).

A further extension compared with previous research on NVB in sport was that we used naturally occurring NVB during sport competition and not artificially created
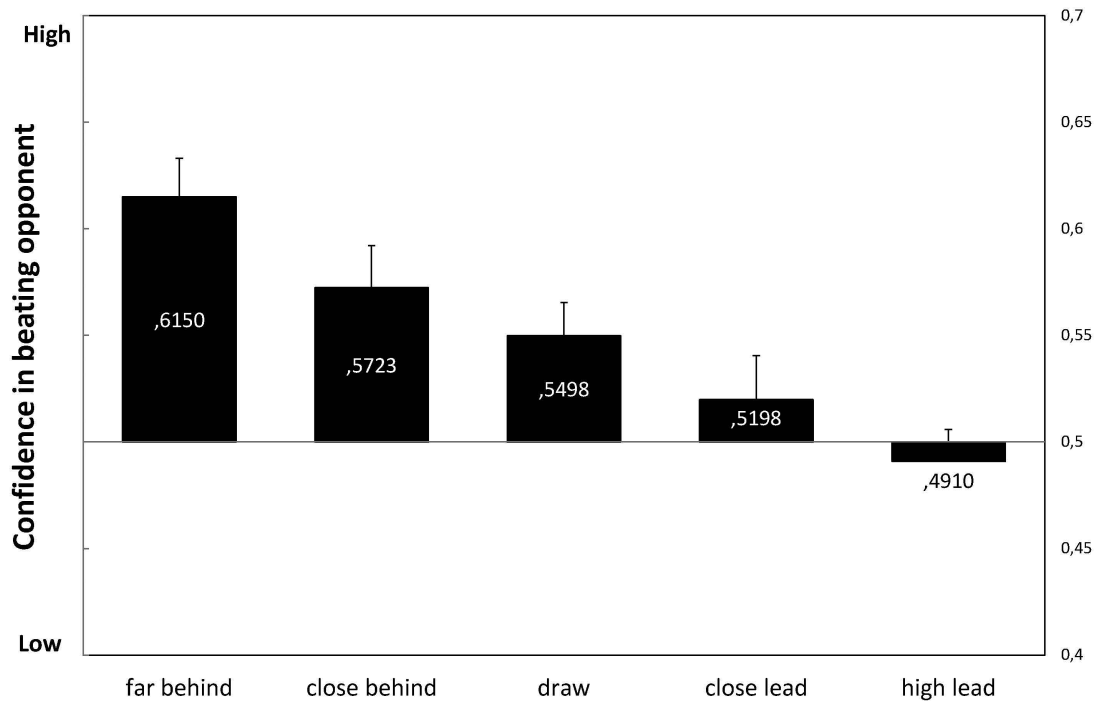
Figure 1 — Mean confidence estimates in beating the opponent as a function of score category. Error bars represent standard errors.

stimuli as has been common practice to date (Furley & Dicks, 2012; Furley et al., 2012; Greenlees, Bradley et al., 2005; Greenlees, Buscombe et al., 2005). One advantage of presenting naturally occurring NVB is that this approach reduces the likelihood that the obtained results are simply due to demand effects. When there is no other information varying between stimuli except for the experimentally manipulated one, then this is the only information participants can use. Videos employed in the present research showed more information than only NVB, which perceivers could have used for confidence estimations (e.g., jersey color, team affiliation). However, using any of this information should not have had any systematic influence on differences between score categories, as this was not confounded with our experimental categories.

The present study tends to agree with Cozolino's (2006) social synapse theory, arguing that human nonverbal communication can be regarded as analogous to the neurochemical communication between synapses. In essence, he suggests that the social synapse can be regarded as the space through which people are linked together into larger units such as families, groups, and indeed, the human race, as it transmits the signals that people send out. In turn, these signals are received by our senses and sent to our brains, where they generate electro-chemical changes that again create new thoughts and behaviors that are finally transmitted back to the social synapse. Cozolino (2006) goes on to propose that this is how humans efficiently coordinate their social lives by reliably interpreting and acting upon the signals they receive via the social synapse: "It appears that social

communication has been chosen by natural selection to be of greater survival value than disguising our intentions and feelings, so much so that we even have ways of unintentionally 'outing' ourselves to others" (p. 24).

Nevertheless, we have to acknowledge the limitations of our hypothetical research scenario. Previous research summarized under the heading "affective forecasting" (Wilson & Gilbert, 2005) indicates that, although people can predict how they are likely to feel in the future, they for example tend to overestimate the intensity of their emotional reactions to anticipated events. Although this affective forecasting bias might transfer to the confidence ratings in our hypothetical scenario (as e.g., evident in the above-average bias), it is important to note that it cannot explain the systematic variation across our experimental categories, as it was equally present over all categories.

Another limitation is that we do not know exactly which NVBs that were expressed in the video clips led to the feelings of more or less confidence in perceivers. We assume that perceivers reacted to nonverbal displays related to dominance or submission. However, we cannot say which emotions were exactly expressed in the video clips, as several emotions may be related to dominance or submission (e.g., aggression). Future research might address this issue by having perceivers explicitly rate the expressions of emotion they witness in the video clips.

Given the importance of self-confidence in sport, Hays et al. (2009) state that it is essential to identify the factors responsible for influencing sport confidence. Of relevance to the present findings, Gould, Guinan, Greenleaf, Medbery, and Peterson (1999) have provided evidence that

confidence levels of athletes are particularly unstable at high levels of competition such as the Olympic Games. The present findings experimentally identify the observation of an opponent's NVB behavior as one potential source of confidence. This source of confidence might be particularly influential when confidence levels are instable. However, the contribution of opponents' NVB to confidence levels relative to other factors remains unclear, as confidence levels will be influenced by multiple interacting factors during actual sporting competition (Hays et al., 2009; Vealey & Chase, 2008). Nevertheless, there is reason to believe that an opponent's NVB might have a substantial influence on confidence, given the emphasis world-class athletes themselves put on NVB as a source of confidence (Hays et al., 2009), as for example evident from the following quote:

". . . I think even if you're not confident inside, you need to present yourself as confident on the outside because that's half the battle won; firstly with yourself, because if you present yourself as confident then you immediately feel more confident, and also for your opponents, if you look confident then you're obviously a little bit more scary, perhaps they don't feel as confident as you look and might be intimidated by that" (p. 1192).

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