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„Sport performance under pressure: the moderating role of fear of negative evaluation and action orientation“

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Abstract

Athletes often find themselves in high-pressure situations where performing their best is mandatory. It was expected that performance declined under pressure and that individuals with high levels of fear of negative evaluation would perform worse under pressure than athletes with low levels of fear of negative evaluation. It was also expected that state-oriented individuals are more likely to worsen their performance under pressure than action-oriented individuals. We tested experienced basketball players ($N = 67$) shooting 15 free-throws under normal conditions (i.e., baseline), followed by another 15 free-throws in a high-pressure condition. In the high-pressure condition an adapted version of the TSST was used to induce pressure. As expected, we did find that overall performance declined under pressure. In our task, fear of negative evaluation showed no effect on free-throw performance under pressure. However, we did find an effect based on self-reported stats from last season. Despite our prediction, we found that state-oriented participants showed a stable performance after the induction of pressure, whereas action-oriented individuals decreased the accuracy of their free-throws. These differences could not be attributed to increased cognitive or somatic anxiety or decreased self-confidence. The results extend prior research by studying personality traits that may moderate choking under pressure.

Keywords: choking under pressure, fear of negative evaluation, action orientation, motor skill failure

Theoretical background

Picture the following situation: An NBA (National Basketball Association) All-Star has just been fouled in Game 3 of the NBA Finals. There are less than two seconds left on the clock and his team is down by two points. All he has to do to tie the game, and thus forcing overtime, is score two simple free-throws. These shots he has scored many times in practice and other games before. There is no action on the field and nothing the defenders can do. The first shot is perfect, nothing but net. Now there is only one free-throw left; he shoots, and he misses it completely, thus losing the game and eventually the championship. This exact situation happened to Dirk Nowitzki in the NBA finals 2006 even though he averaged to make 90,1% (NBA advanced stats 2005-2006, 2019) of his free-throws during the regular season. But not this time, not in this situation, he misses the shot, he loses the game, he chokes under pressure.

Not only athletes but generally most people often find themselves in high-pressure situations where performing their best is mandatory. Whether it is a high school graduate taking an entrance examination at the university or an actor auditioning for a role, superior performance in high-stake situations is crucial for advancement in many aspects of life. In the context of sports, sometimes athletes are able to rise up to the occasion and even boost their performance at the crucial moment and to make all the difference to win the game (*clutch performance*). Whereas at other times athletes' performances decreases and they *choke under pressure*.

The issue of choking under pressure in sport performance has been investigated and discussed for more than three decades (e.g. Baumeister, 1984; Beilock & Gray, 2007) yet, the opposite of choking, clutch performance, has only been studied in a few recently published studies (e.g. Hill, Hanton, Matthews, & Fleming, 2010; Otten, 2009). Still the question remains, what leads athletes to either show an inferior or a superior performance in such stressful situations. The aim of this thesis is to shed light on and to further extend the understanding of sport performance under pressure and personality by exploring and testing the effects of fear of negative evaluation and action orientation. More specifically, I will compare the free-throw performance of experienced basketball players in low- and high-pressure situations and test whether the individuals fear of negative evaluation or disposition towards action orientation moderate's performance.

Choking under pressure

The ability to perform well in high-stakes situations is an important aspect of competitive sport. In these situations, the athletes desire to perform as well as possible is thought to

create performance pressure (Baumeister, 1984; Hardy, Mullen, & Jones, 1996). How the athlete deals with this performance pressure might decide the outcome of a game or a championship. Baumeister (1984, p. 610) describes this felt pressure as "any factor or combination of factors that increases the importance of performing well on a particular occasion" and defines choking as "performance decrements under pressure circumstances" and more specifically, "the occurrence of inferior performance despite striving and incentives for superior performance" (Baumeister & Showers, 1986, p. 361). Some authors believe that choking is not just a poor or any inferior performance, but rather suggest that choking is a sub-optimal performance, an acute performance failure, a significant deterioration or a significant drop in performance under pressure (Clark, Tofler, & Lardon, 2005; Gucciardi & Dimmock, 2008;). Accordingly, a choke is a specific negative response to a high-pressure felt situation and does not reflect just a random fluctuation in skill level (Beilock & Gray, 2007; Hill et al., 2010). Research (e.g. Clark et al., 2005; Hill et al., 2010; and Smith et al., 2000) further distinguishes choking from other forms of performance failure such as panic, yips and slumps.

Recent studies (Mesagno & Mullane-Grant, 2010) have attempted to redefine choking as "a critical deterioration in skill execution leading to substandard performance that is caused by an elevation in anxiety levels under pressure at a time when successful outcome is normally attainable by the athlete" (p. 343). Along with this definition Mesagno, Marchant and Morris (2008, p.439) define choking as "a critical deterioration in the execution of habitual processes as a result of an elevation in anxiety under perceived pressure, leading to substandard performance". Very much alike, authors (Gucciardi, Longbottom, Jackson, & Dimmock 2010, p. 79) have suggested, that the interplay of higher levels of perceived pressure and maximal incentives for optimal performance lead to "acute or chronic forms of suboptimal performance or performing more poorly than expected given one's skill level and self-set performance expectations". All three of these studies offer definitions of choking that still imply the performance decrement under pressure regarding the athlete's performance skills, but also emphasizing the element of heightened anxiety, which is essential for choking to occur (Mesagno, & Mullane-Grant, 2010). Therefore, for a performance decrement to be a choke, it must be clear, that the athlete was motivated to succeed, was capable of performing better, regarded the situation as important and felt increased anxiety. As a result of the increased felt anxiety, performance declines significantly. However, such definition would limit its usability within quantitative research because of the variety of aspects being considered. acknowledge the link between high-pressure situations and inferior performance (Hill et al., 2010).

In accordance with Beilock and Gray (2007), we suggest that heightened levels of perceived pressure leading to sub-optimal performance are decisive and sufficient criteria to classify a performance as choking under pressure. Therefore, choking is defined behaviorally in

terms of performance outcomes. By focusing on the link between perceived pressure and performance, rather than additional links such as personal felt importance and motivation, it makes it easier to diagnose choking in sports. It also provides a broad definition that can easily be applied to a variety of situations either in laboratory settings or in actual game situations and does not make theoretical assumptions about the correlates of choking due to its limited terms of criteria necessary to classify an instance of performance decrease as such (Beilock & Gray, 2007).

If choking is on one end of the performance spectrum, *clutching* or *clutch performance* would be on the other end. Otten (2009) defines a clutch performance as any performance increment or superior performance that occurs under pressure circumstances. It refers to high levels of performance in a critical situation, such as scoring the game-deciding shot or showing a superior performance during the last minutes of the game. Some authors have characterized clutch states by "complete and deliberate focus on the task, intense effort, and heighten awareness of the situation and its demands" (Swann, Crust, & Vella, 2017, p.49). During clutch performances athletes describe the absence of negative thoughts and also that their skill execution is automatic, even though they are more conscious of the demands of the situation and the consequences of succeeding or failing (Swann et al., 2017). Under pressure, "clutch states occur through a more sudden 'switching on' and 'stepping up' of effort and intensity" (Swann et al., 2017, p. 49).

Mechanisms of choking

While some authors (e.g. Beilock & Gray, 2007; Hill et al., 2010) are still mentioning *drive theories* (Spence, & Spence, 1966) most of the recent literature focus entirely on attentional theories (e.g. DeCaro, Thomas, Albert, & Beilock, 2011; Englert & Oudejans, 2014; Masaki, Maruo, Meyer, & Hajcak, 2017; Worthy, Markman, & Maddox, 2009). Hence, I will also focus exclusively on attentional theories.

Within the attentional theories, two conceptual approaches have been proposed to explain choking under pressure: *distraction theories* and *self-focus theories*. Even though both approaches appear to be competing alternatives and propose opposite mechanisms of choking, it should be considered that they may have different domains of applicability and therefore could be complementary rather than mutually exclusive.

Distraction theories propose that high-pressure situations create anxiety which leads to the allocation of attentional resources from skill execution to task-irrelevant cues, such as worrying about the situation and its consequences, and thus distracting the individual (Wine, 1971). The primary distraction theories of choking are the processing efficiency theory (PET; Eynsenck & Calvo, 1992) and its elevation called the attentional control theory (ACT;

Eysenck, Derakshan, Santos, & Calvo, 2007). Both theories assume that anxiety disturbs the processing resources so that processing efficiency decreases. Thus, the effort to execute the task has to be increased in order to maintain performance under pressure (Schücker, Hagemann, & Strauss, 2013). This shift of focus results in a dual-task situation in which situation-related concern compete with the attention required to execute skills correctly.

Distraction accounts of choking are primarily based on studies (e.g. (Beilock & DeCaro, 2007; Beilock, Kulp, Holt, & Carr, 2004; DeCaro et al., 2011) of cognitive performance but not all tasks or skills do rely so much on working memory. In the context of sports supporting distraction theories are a number of qualitative studies (Englert & Oudejans, 2014; Gucciardi et al., 2010; Hill et al., 2010; Oudejans, Kuijpers, Kooijman, & Bakker, 2011) which are based on verbal reports and interviews with athletes and sport psychology practitioners. The key finding in these studies is, that recalled choking episodes often contain the task-irrelevant preoccupation but rarely contain explicit monitoring or control during the execution. Athletes usually attribute their choking episode to the dysfunctional thinking (e.g., fear of failure, worries, self-doubt) emphasized by distraction accounts (for a review, see Roberts, Jackson, & Grundy, 2017). Quantitative evidence supporting distraction theories are found in the visual search literature where researchers have investigated gaze behavior to assess visual attention and processing efficiency in aiming tasks. Their findings have been related to the findings of PET and ACT. These studies connect pressure to task-irrelevant thoughts and following to motor skill failure (for a review, see Roberts et al., 2017).

Regarding the topic of choking under pressure in sport performance, motor skills that are often practiced are thought to become proceduralized (e.g. dribbling in football, free-throw-shooting, putting in golf). It is argued that such skills do not require the constant working memory monitoring and are considered to run outside of working memory (e.g. Beilock, Carr, MacMahon, & Starkes, 2002; Proctor & Dutta, 1995). Therefore, numerous researchers (Beilock & Gray, 2007; Gucciardi & Dimmock, 2008; Hill et al., 2010; Mesagno & Mullane-Grant, 2010) have assumed that self-focus theories are the more credible explanations while still acknowledging that distraction theories remain relevant to sport, but without giving much elaboration why.

Self-focus theories propose that performance pressure increases an athlete's level of self-consciousness and anxiety about performing correctly (Baumeister, 1984). This increased self-focus causes the athletes to turn their attention inwardly, consciously monitoring and controlling their skill execution, thus disrupting the automaticity of well-learned skilled movements, which results in choking (Baumeister, 1984; Beilock & Carr, 2001). Alternatively, self-focus may cause athletes to miss task-relevant cues (Baumeister & Showers, 1986), leading to distraction and thus suboptimal performance.

Self-focus theories are closely linked with the theoretical stages of learning which have been proposed by Fitts and Posner (1967). They have suggested a three-stage process of motor learning that includes a cognitive stage, an associative stage and an autonomous stage. In the cognitive stage, the athlete is just beginning the learning process and typically starts with unintegrated explicit knowledge of a motor skill that is distinctly controlled in a step-by-step manner through working memory. During the second, associated stage, the athlete physically practices the execution of the skill learned before and thus connects the explicit knowledge with behavioral experiences. The final, autonomous stage appears after extensive practice. The athlete is now able to perform the acquired skill automatically, without requiring conscious effort to complete the skill. After the motor skill becomes automated, the athlete does not need to think about the process anymore (Fitts & Posner, 1967; Gröpel, 2015).

With regard to the model of Fitts and Posner (1967) when choking in sport occurs, the athlete regresses to the early cognitive stage of motor learning where motor skills rely on explicit knowledge and the step-by-step execution. Other authors (Masters,1992) support this claim that choking occurs because the athlete focuses attention to motor execution. Under pressure, the athlete starts to think about how they are executing the skill correctly and tries to control it by using explicit knowledge of its mechanics. The performer reinvests this knowledge that was employed for skill control at earlier stages of skill learning, to control the skill, which may then lead arbitrary execution at the beginner level (Gröpel, 2015).

The shift from automatic to controlled skill execution is assumed to interrupt the flow of behavior and thus disrupts performance. Studies have embraced the aspect of conscious control with the modification that the final mechanism of the motor skill breakdown is the monitoring of the step-by-step process of skill execution (Beilock and Carr, 2001; Roberts, et al., 2017). It is widely assumed that explicit attention to step-by-step processes disrupts the learning and execution of well-learned or proceduralized processes that usually run outside of conscious awareness (Baumeister, 1984; Beilock & Carr, 2004; Kimble & Perlmuter, 1970; Masters, 1992).

Support for self-focus theories are primarily found in motor tasks such as golf-putting (Master, 1992; Hardy et al.,1996; Beilock & Carr, 2001), simulated baseball batting (Gray, 2004), and basketball free-throw shooting (Gröpel, 2015; Liao & Masters, 2002). However, some researcher suggest that elite athletes do willingly engage in some explicit thought during the execution of a motor task without detriment (Roberts et al., 2017). Some studies suggest that athletes are thought to use part-process cues, in which they focus on certain bodily features while other automated elements work in the background (Toner, Montero & Moran, 2016). Maurer and Munzert (2013) supportively found that skilled basketballer players prefer to focus on specific body movements (e.g. snapping the wrist) in free-throw execution which

would go along with the theory of reinvestment (Masters, 1992). Likewise, research showed that golfers are able to make technical changes to their putting stoke without losing overall proficiency and might even have value as a coping strategy (Toner & Moran, 2011).

Individual differences and susceptibility to choking

Laboratory studies attempt to mimic the types of pressure situations found in real world scenarios. In some cases, researchers (e.g. Beilock & Carr, 2011, Gray 2004) have accomplished this by administering scenarios that include monetary incentives, peer pressure, and social evaluation components. In real world athletic competitions, performance is judged by coaches, fans, and teammates (i.e., social evaluation); there are monetary consequences for winning and losing (i.e., monetary incentives), and often team success depends on individual performance which may generate peer pressure to perform at an optimal level (Beilock & Gray, 2007). Leith (1988) has induced choking by merely making salient the concept of pressure induced skill failure in important situations. He found that the performance of individuals shooting free-throws who were aware of the fact that some people have the tendency to choke at the free-throw line declined in comparison to those who did not know this.

Research has demonstrated that choking under pressure is likely to relate to factors, such as audience presence (Butler & Baumeister, 1998), dispositional self-consciousness (Baumeister, 1984), performance expectations (Baumeister, Hamilton, & Tice, 1985), and task characteristics (Baumeister, Hutton, & Cairns, 1990).

In line with previous findings Baumeister (1984) suggests that an athlete with high dispositional self-consciousness is less likely to choke. Under pressure athletes focus inwardly and become more immune to the detrimental effects of self-focus. Although Baumeister's (1984) findings are consistent with self-focus theories of choking, more recent studies have found that athletes who are high in self-consciousness were more likely to choke because they were susceptible to self-focusing under pressure (e.g. Liao & Masters, 2002; Wang, Marchant, & Gibbs, 2004). Therefore, further research is required to find an agreement on the role of self-consciousness.

Another variable that may moderate choking under pressure in sport performance is the presence of an audience. However, literature could not agree whether the effect is positive or negative. Some studies (e.g. Wallace, Baumeister, and Vohs, 2005) indicate that a supportive audience would cause the athletes anxiety levels to increase and thus encouraging the athlete to self-focus, leading to choking. Yet, other studies indicate evidence for a home advantage, where a supportive audience enables athletes to perform better under pressure (e.g. Thomas, Reeves, & Ball, 2008). Consequently, the presence of an audience can influence

choking under pressure, but its effect may rely on other variables. More research has to be done (for a review, see Pollard, 2006).

Serval other potential moderators of choking in sport have been identified including dispositional reinvestment (Masters, Polman, & Hammond, 1993), trait anxiety and self-confidence (Baumeister & Showers, 1986; Wilson et al., 2009), skill level (Beilock & Carr, 2001), stereotype threat (Chalabaev, Sarrazin, Stone, & Cury, 2008), public status (Jordet, 2009), athletic identity (Mesagno et al., 2012) and self-control strength (Englert, Bertrams, Furley, & Oudejans, 2014). In their qualitative examination of choking under pressure in team sports, Hill and Shaw (2013) offer further insights of what may lead athletes to choke. Perceived antecedents are for example the importance of the game, expectations and the individual responsibility. Perceived moderators included team cohesion, the motivational climate and coping style. Also, in the context of basketball and free-throw shooting, research (Cao, Price, & Stone, 2011) found that players are more likely to choke when they are worse overall free-throw shooters, and on the second shot of a pair, after the first is missed.

Fear of negative evaluation

One factor that may moderate sport performance under pressure may be the athletes fear of negative evaluation. In general, the concept of fear of negative evaluation (FNE) is often mention in the clinical context of social anxiety disorders. It is considered as one of three fundamental fears which are thought to increase the likelihood of the development and expression of more general fears, anxiety, and psychopathologies (Reiss & McNally, 1985). Characterized by the apprehension to be evaluated or analyzed by others, social anxiety disorder creates significant impairment and often leads to the avoidance of social situations (APA, 2013). In the context of sport performance under pressure FNE has received little to no attention in the scientific community. Exceptions are a few studies (Geukes et al., 2017; Mesagno, Harvey, & Janelle, 2012) which link FNE to self-presentation concerns and self-consciousness.

FNE refers to “fears, concerns, or worries regarding negative evaluations from peers” (La Greca & Lopez, 1998, p. 86). Watson and Friend (1969) specify FNE as “apprehension about others evaluation, distress over their negative evaluations, avoidance of evaluative situations, and the expectations that others would evaluate oneself negatively” (p. 449).

Individuals with high levels of FNE fear and apprehend to be judged unfavorably by others (Dryman, Gardner, Weeks, & Heimberg, 2015). In the context of sports, they may fear of being judged negatively by coaches, team mates, fans or the audience. Exaggerated levels of FNE are commonly endorsed by individuals with social anxiety disorder and contribute to a heightened sensitivity to cues of potential social threat. Individuals with high levels of FNE

score higher on measures of social anxiety and distress than individuals with low levels of FNE (Winton, Clark, & Edelmann, 1995).

The link between FNE and performance under pressure has been investigated in a basketball shooting task with experienced basketball players in a laboratory setting (Mesagno et al., 2012). The aim of this study was to find out whether high and low levels of FNE differentiate the susceptibility of athletes to choke and whether FNE is associated with changes in anxiety and performance outcome as pressure is increased. Athletes high in FNE showed a significant increase in competitive anxiety and a significant decrease in performance in a basketball shooting task from a low- to a high-pressure phase. Additionally, results suggest that cognitive state anxiety partly mediate the relationship between FNE and performance, indicating that extensive worries have an additional negative effect upon sport performance under pressure (Mesagno et al., 2012). The relevance of FNE on sport performance, by the way of basketball free-throw shooting performance, was also tested in public real-world competitions (Geukes et al., 2017). Experienced basketball players provided personality respective trait measures (i.e., for FNE, dispositional reinvestment and athletic identity) and were assessed, regarding perceived importance, state anxiety and free-throw performance in a low-pressure phase (only researcher and athlete in a familiar training venue) and a public real-world high-pressure condition (12 subsequent league basketball matches). The results of the study suggest that FNE exhibits a significant negative relationship with performance in high-pressure conditions. Athletes with high levels of FNE also experienced higher levels of somatic and cognitive state anxiety and lower levels confidence in high-pressure situations.

The mechanism of FNE and the effect on sport performance and anxiety remains uncertain. Analogous to Baumeister's (1984) self-consciousness argument which was mentioned in the previous chapters, athletes high in FNE may be safeguarded against choking because they are used to the heightened anxiety that is caused by performance under pressure and the experience of FNE. Other findings (Mesagno et al., 2012), however, argue that in high-pressure situations, such as shooting free-throws, athletes high in FNE experience additional public self-consciousness than athletes with low levels of FNE. They become aware of being observed by the coaches, team mates and the audience and become more concerned about the attention and about being judged negatively. Thus, the athletes FNE could lead to distraction (e.g. Roberts at al., 2017) and heightened self-focus (e.g. Baumeister, 1984; Beilock & Carr, 2001).

Action versus state orientation

Another factor that may influence sport performance under pressure is the personality disposition toward action orientation (AO) versus state orientation (SO). The disposition

towards AO versus SO explains how individuals react or adapt to demanding conditions throughout their goal pursuits. The theory also explains why individuals have "mental activities and behaviors that are disassociated with their current goals, and how these disassociated states of mind reduce self-regulatory efficiency" (Jaramillo & Spector, 2004, p. 251).

The construct of AO versus SO was introduced by Kuhl (1984) as part of a broader theory of volitional action control. According to this theory, individuals may self-regulate their action in two opposing volitional modes, either a change-promoting (AO) or change-preventing (SO) mode. Although individuals likely fall on a continuum of AO versus SO, it is helpful to further describe the characteristics to contrast those individuals who are more AO versus those who are more SO.

Studies (e.g. Diefendorff et al., 2000; Jaramillo & Spector, 2004; Kuhl, 1994b, Kuhl & Beckmann, 1985) have identified three dimensions within the concept of AO-SO that can be distinguished: The first dimension relates to the individual's ability to restore positive affect in order to initiate action. This dimension is called *hesitation* (versus initiative). Individuals who score high on hesitation have difficulties to self-regulate positive affect and they struggle to start an action or task. They often engage in actions and thoughts that are irrelevant for achieving the desired goal (e.g. Kuhl, 1994a; Jaramillo & Spector, 2004). These individuals are characterized by "the vulnerability to persevere on induced cognitive and affective states even if the perseveration is detrimental to performance" (Gröpel, 2015, p. 2). On the other side of the continuum are individuals who score low on the hesitation dimension and are AO. They have no difficulties to initiate an action and are not easily distracted by goal-irrelevant tasks or thoughts, even though the task might be boring or demanding (Kuhl, 1994b). Such individuals are able to devote their cognitive resources to the current task, which enables them to move from a present goal state to the desired future goal state (Diefendorff et al., 2000).

The second dimension is called *preoccupation* (versus disengagement) and describes the inability to cope with negative affect (Kuhl, 1994b). SO- Individuals score high in preoccupation and have difficulties to self-regulate their affective state after failure and setbacks. They become preoccupied with their failure during high-demand situations and fail to refocus on the task at hand. This dimension has also been called failure-related AO or threat-related AO (Baumann, Kaschel, & Kuhl, 2005). AO- individuals score low on preoccupation and can flexibly allocate their attention for the sake of task execution and goal attainment. They are characterized by enhanced performance efficiency and the ability to complete tasks even after minor failures and setbacks (Jaramillo & Spector, 2004). Kuhl (1981) found performance decrements on a complex cognitive task among SO-individuals but not among AO-individuals after repeated failure was induced. Further AO individuals reported less unpleasant feelings in response to repeated failure experiences (Brunstein & Olbricht, 1985) and showed fewer

depressive symptoms compared to SO- individuals, after pressure was induced (Rholes, Michas, & Shroff, 1989).

The third dimension is called *volatility* (versus persistency) which describes the individual's inability to remain focused on goal related-activities. SO individuals struggle to effectively maintain focus on an intension until the task is completed, they are easily pulled off-task, which impairs their overall performance (Diefendorff et al., 2000).

Jaramillo and Spector (2004) conclude that these dimensions: "paint a picture of an individual who cannot initiate tasks, initiates tasks but gets bogged down in details and cannot complete them, or initiates tasks and gets distracted and cannot complete them. In other words, state orientation is a breakdown in the ability to effectively regulate actions towards goal achievement" (p. 252). Therefore, studies (e.g. Heckhausen & Strang, 1988; Koole & Jostmann, 2004; Koole, Jostmnn, & Baumann, 2012) suggest that demanding situations influence AO versus SO individuals in opposite ways. Demanding conditions should promote self-regulation among AO individuals, while interfering self-regulation in SO individuals. These differences between AO and SO individuals should especially emerge in evaluative or threatening situations (Kuhl, 1994b). In low-demanding situations, SO individuals may display equal or even better self-regulation than AO individuals (Koole et al., 2005).

Research on sport performance within the action-state literature supports the benefitable disposition towards AO but focuses mainly on the hesitation dimension, or prospective and decision-related action orientation (AOD): AO moderates choking effects after the participants were told to try to break their personal record on a standardized basketball track (Heckhausen & Strang, 1988), AO basketball player shoot more often at the basket than SO players and are generally faster in decision making (Raab & Johnson, 2004), after players are depleted, AO individuals outperform SO individuals in different sport tasks (Gröpel, Baumeister & Beckman, 2014).

In this thesis, only the preoccupation dimension, or failure-related AO (AOF) is taken into account since it is especially important in regard to sport performance under pressure. When athletes make mistakes in a game (e.g they missed an easy shot, they caused a turnover, they unnecessarily fouled) it is important, that they get over it quickly and refocus on the game. Thus, an AO approach would be beneficial. Studies suggest, that AO predicts the free-throw performance of basketball players after the induction of self-focus (Gröpel, 2015). With regard to choking, pressure is seen as a threat which activates negative affect (such as worries, thought about the outcome etc.). In order to maintain performance, the athlete has to restore the positive affect that became inhibited through pressure. This affect may either be restored externally (e.g., through pep talks from coaches or encouragement from team mates and audience) or internally (e.g., by positive self-talk). In some occasions, however, it might be

impossible to rely on external support and athletes may be unable to self-generate positive affect (Koole, Kuhl, Jostmann, & Vohs, 2005). Athletes with high levels of AO are more able to down regulate that negative affective state which leads to composure so that the athlete can perform the desired task accurately. If the athlete is not able to down-regulate this affective state, he or she will be more drawn to distraction which leads to performance deficits.

Research question and hypothesis

With regard to the above research, the question remains why some athletes choke under pressure and some do not. Research suggest lots of possible explanations. In this study I will explore the role of the personality traits fear of negative evaluation (FNE) and the individual's disposition towards Action- vs. State Orientation (AO vs. SO) in a basketball free-throw shooting task. Free-throw shooting was selected for diverse reasons. Because the free-throw is a standardized performance task, the shooter has full control of his movement, other players can not interfere, and the environment is not variable. Also, free-throws are at the same time one of the easiest ways to score but thus also one of the most important and anxiety provoking game situations in basketball (Mascret et al., 2016).

On the basis of previous findings and researches, I hypothesize the following:

- H1: Individuals will perform worse in in a basketball free-throw task after pressure is induced, compared to low-pressure condition.

- H2: Individuals with higher levels of FNE will perform worse in a basketball free-throw task after the induction of pressure than individuals with low levels of FNE, but not in low-pressure condition.

- H3: SO- Individuals will perform worse in a basketball free-throw task than AO-Individuals after the Induction of pressure, but not in low-pressure condition.

Method

Participants

Sixty-seven basketball players from different basketball teams in Vienna participated voluntarily in this study. Participants characteristics are presented in Table 1. Prior to entering the study, all participants were briefed on the study and gave their informed consent. One male participant was excluded from the study because he refused to participate in the TSST.

Table 1

Participants Characteristics

Participants in current study	66
Male (%)	45 (68,2)
Female (%)	21 (31,8)
Lefthanded (%)	11 (16,7)
Righthanded (%)	55 (83,3)
Age mean (SD)	24,68 (6,78)
Basketball experience in years mean (SD)	13,21 (6,25)
Trainings per week median (range)	2 (1 to 10)

Procedure and apparatus

The study was performed on a basketball court during their teams regular training and consisted of two phases, pretest phase under normal condition (i.e., baseline), followed by the posttest under enhanced pressure. The Participants shot basketballs from the standard free-throw line (4,6m distance) to a standard-size ring (45 cm in diameter) attached to a backboard at a height of 3,05m. All measures of the apparatus were in accordance with the International Basketball Federation regulations.

Coaches were informed and agreed to the process. Before the beginning of practice, all participants were briefed, and gave their informed consent. They were asked to fill out a questioner containing questions about their demographics and measuring fear of negative evaluation and action orientation. Afterwards all player took part in a regular 15 minute warm up, supervised by the coach. Thereafter, one player at a time was called to the free-throw line and their baseline performance was tested. They were given two free-throws for practice. Afterwards they completed the measurement of state anxiety. Thereupon they shot 15 free-throws and then joined the rest of the team for usual training. After each player completed the first set

of free-throws, players returned in the same order. They were told that they will now shoot 15 free-throws under pressure. Before shooting the free-throws, pressure was induced by an adapted version of the Trier Social Stress Test, TSST (Kirschbaum, Pirke, & Hellhammer, 1993). Participants performed a mental arithmetic task in front of my self and two other assistants which were unknown to the athletes. The assistants were briefed to not give any verbal or facial feedback and to show no emotions. Participants were given the task to subtract the number 13 from 1022 for the following five minutes. They had to verbally report their answers aloud to the audience. If a mistake was made, participants were told to start over from 1022 again. After every 10 subsequently correct answers, participants were instructed to answer faster with the instruction *schneller, bitte* (faster please). Afterwards state anxiety was measured for second time and finally the players shot 15 free-throws as posttest. Participants free-throw performance was evaluated by using a 6-point system adopted from Hardy and Parfitt (1991). Each shot could score up to six point: 6 for a clean basket, 5 for rim-and-in, 4 for backboard-and-in, 3 for rim-and-out, 2 for backboard-and-out, and 1 for a complete miss. Finally, participants were debriefed, thanked and dismissed.

Measures

Fear of negative evaluation. To measure the players levels of fear of negative evaluation the FNE-K (English version is the Brief Fear of Negative Evaluation – revised, BFNE-R) which is a revised version (Carleton, McCreary, Norton, & Asmundson, 2006; Carleton, Collimore, McCabe, & Antony, 2011) of the BFNE self-report measure (Leary, 1983) was used. It is designed to access individual's tolerance for the possibility that they may be judged critically or hostilely by others - their levels of FNE. The scale consists 12 items, eight which were originally straightforwardly worded items and four items that were originally reverse-worded, revised to straightforwardly worded. Each item is rated on a 5-point Likert-type scale, ranging from 1 (*überhaupt nicht charakteristisch für mich* - Not at all characteristic of me) to 5 (*äußerst charakteristisch für mich* – extremely characteristic of me). An example item used in the present study is: *Ich mache mir Gedanken darüber, was andere Leute von mir denken, auch wenn ich weiß, dass es egal ist* ('I worry about what other people think of me even when I know it doesn't make any difference'). The sum ranges from 12-60, with higher scores indicating higher levels of FNE. The FNE-K has demonstrated internal consistency (α = .94), factorial validity, construct validity, and 2-week test-retest reliability (Reichenberger et al., 2016).

Action orientation. Action Orientation was measured with the HAKEMP 90 questioner (English version is the ACS-90 or Action Control Scale-90) which is the most recent version of the self-report measure developed by Kuhl (1985). The scale is used to assess

individual differences towards AO or SO. In the present study a german adaption of Kuhl's (1994a) well-validated Action Control Scale (Diefendorff et al., 2000) was used. The scale was reduced to 24 items and measures two dimensions of Action Orientation: 1. failure-related action orientation (AOF) and 2. Prospective or decision-related action orientation (AOD). Each dimension consist of 12 brief everyday life scenarios and participants are required to choose one of two options that indicate what they would do. One option indicates an AO approach to deal with the scenario while the remaining one indicates a SO approach. An example for an AOF item from the HAKEMP 90 used in this study is: *Wenn ich vier Wochen lang an einer Sache gearbeitet habe und dann doch alles mißlungen ist, dann*: (a) *dauert es lange, bis ich mich damit abfinden kann*, or (b) *denke ich nicht mehr lange darüber nach*. ('When I've worked for weeks on one project and then everything goes completely wrong: (a) It takes me a long time to get over it, or (b)It bothers me for a while, but then I don't think about it anymore'.) In this example item, option (a) reflects the SO alternative and option (b) the AO alternative. The scenarios with the AO approach scored one point, whereas the SO approach scored zero. High scores on the two subscales indicate a disposition towards AO and thus, low scores indicate towards SO. AO was analyzed as a continuous variable, but for descriptive reasons participants were classified as either AO or SO on the basis of the empirical median, similar to previous studies (Gröpel, 2015; Gröpel et al., 2014). Participants who scored above the median were classified as AO, whereas the remaining participants were classified as SO. Even though all players filled out the complete questioner, in this study, only the score in the AOF dimension is relevant.

State anxiety. To check whether the TSST actual induced anxiety in the participants, state anxiety was measured using the German version of the Mental Readiness Form-3 (MRF-3; Krane, 1994) which can be used in a quick and efficient manner without much disruption. The MRF-3 consists of three separate 100 millimeter (mm) continuums that are anchored between *gelassen* and *besorgt* for cognitive anxiety (calm and worried), *entspannt* and *angespannt* for somatic anxiety (relaxed and tense) and *sicher* and *unsicher* for self-confidence (confident and not confident). The participant places a mark on each of the three lines to show how he or she was feeling at that moment. The measurement between the left part of, and the participants mark on the line was the participant's score out of 100, with higher scores indicating higher levels of anxiety.

Results

There were no significant differences between men and women in the study variables except the score in the action orientation after failure scale (AOF). Men scored on average higher than women, suggesting a higher disposition towards AO, rather than SO. The mean male score was 6.53 (SD = 2.76), and the mean female score was 5.05 (SD = 2.73), $t(63) = 2.01$, $p = .049$. However, controlling for gender did not significantly affect any of the results. In addition, age did not correlate with any of the study variables except FNE. Nevertheless, controlling for age did not affect any of the result. Therefore, we do not discuss gender and age any further. Intercorrelations of study variables are displayed in Table 2.

Table 2

Intercorrelations of Study Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Age	1							
2. Experience	.79**	1						
3. Attendance	-.54**	-.41**	1					
4. Pretest	-.15	.10	.34**	1				
5. Posttest	-.21	.08	.37**	.57**	1			
6. FNE	-.28*	-.13	.22	.07	.13	1		
7. AOF	.07	.01	-.26*	-.01	-.28*	-.49**	1	
8. Training average	-,34*	-.07	.34*	.64**	.58**	.11	-.03	1
9. Game average	-.25	-.00	.30*	.56**	.57**	-.19	-.01	.78**

* $p < .05$. ** $p < .01$.

Manipulation check anxiety

As shown in Table 3 the athletes scores in the MRF-3 significantly increased between before and after the induction of pressure through the TSST, suggesting that the pressure manipulation was successful. Compared to the pretest, cognitive anxiety increased in the posttest by a mean of 10.82 (SD = 23.89, $t(65) = -3.68$, $p < .01$, $d_z = .45$), somatic anxiety increased in the posttest by a mean of 17.99 (SD = 28.65, $t(65) = -5.1$, $p < .01$, $d_z = .63$) and self-confidence decreased in a posttest by a mean of 10.02 (SD = 21.85, $t(65) = -3.72$, $p < .01$, $d_z = .46$). Further, free-throw performance was uncorrelated with cognitive and somatic anxiety, but it correlated with self-confidence, indicating that athletes with higher scores in self-confidence (thus being more self-confident) reached a higher score in free-throws. We found that

FNE correlated with pretest anxiety levels such as cognitive anxiety ($r = .35$, $p < .01$), somatic anxiety ($r = .30$, $p = .02$) and self-confidence ($r = .32$, $p < .01$), but was uncorrelated with post-test anxiety levels, except for self-confidence ($r = .24$, $p = .02$).

Table 3

Means and Standard Deviations Manipulation Check

	Pretest			Posttest		
	n	*M*	*SD*	*n*	*M*	*SD*
cognitive anxiety	66	21.86	17.26	66	32.70	22.02
somatic anxiety	66	28.03	21.85	66	46.02	23.17
self-confidence	66	27.35	19.95	66	37.36	23.11

Note. Mean score out of 100, with higher scores suggesting higher anxiety levels and lower self-confidence

Task performance under pressure

We hypothesized that the athletes will perform worse in the basketball free-throw task after pressure is induced, compared to the low-pressure condition. Means and standard deviations are shown in table 4. Free-throw performance was evaluated by using a 6-point system, with higher points indicating a better performance. Results show that the overall performance declined after the induction of pressure, when compared to the pretest phase ($M = 0.16$, $SD = 0.43$, $t(65) = 2.97$, $p = .004$, $d_z = .37$).

Additionally, we compared participants self-reported free-throw stats from last season. We compared free-throw performance in trainings with their free-throw performance in actual games. Results show that athletes' free-throw performance declined in game situations, compared to training situation ($M = 9.58$, $SD = 10.46$, $t(47) = 6.35$, $p < .01$, $d_z = .92$). This suggests that athlete's free-throw performance declines when pressure increases.

Table 4

Means and Standard Deviations free-throw performance

	n	*M*	*SD*
Pretest	66	4.77	.42
Posttest	66	4.62	.49
Training average	48	72.5	14.77
Game average	48	62.92	16.25

Note. Pretest and Posttest show mean score of each shoot ranging from 1 – 6 points. Average Training and Game show mean in percentage.

Fear of negative evaluation and task performance

We hypothesized that individuals with higher levels of FNE will perform worse in a basketball free-throw task after the induction of pressure than individuals with low levels of FNE, but not in low-pressure condition. FNE was uncorrelated with the pretest free-throw performance, implying that player with high levels of FNE and player with low levels of FNE did not differ in their shooting accuracy before the induction of pressure. The main dependent variable was deterioration in performance from before to after the induction of pressure. A hierarchical multiple regression analysis [1]was conducted on the posttest free-throw performance. The baseline (pretest) performance was entered as the first blocking variable, and FNE was added in the second step.

As shown in Table 5, the first step with the pretest free-throw performance showed a significant effect, $R^2 = .32$, $F(1,64) = 30.14$, $p < .01$ whereas the second step with FNE, $\Delta R^2 = .01$, $\Delta F(1, 63) = .80$, $p = .37$ showed no effect. The posttest free-throw performance was strongly predicted by the pretest score ($\beta = .57$, $p < .01$), indicating merely that there were stable individual differences in performance. FNE ($\beta = .09$, $p = .37$) did not predict posttest performance suggesting that FNE does not moderate posttest performance.

[1] All applicable conditions such as interval scale level, normal distribution of the residues, linearity, homoscedasticity, independency of the data and the residues as well as multicollinearity were met.

Table 5

Multiple Regression Analysis of FNE on Posttest Performance

Condition	*B*	*SE B*	*β*	R^2	ΔR^2
Step 1				.32**	
Pretest	.66	.12	.57**		
Step 2				.33**	.01
Pretest	.66	.12	.56**		
FNE	.06	.06	.09		

Note. *B* = unstandardized coefficients; *SEB* = standard errors of unstandardized coefficients for the variables in the final regression equation; β = standardized coefficients; R^2 (ΔR^2) = cumulative (change in) variance accounted for at each step. Baseline performance (pretest) is controlled for at Step 1.

** $p < .01$.

Another hierarchical multiple regression analysis was conducted on the self-reported free-throw performance in games. In the first step the free-throw performance in training was entered as a blocking variable and FNE was added in a second step. Results can be seen in Table 6. Both the first step with the training free-throw performance, $R^2 = .60$, $F(1,46) = 69.95$, $p < .01$, and the second step with FNE, $\Delta R^2 = .08$, $\Delta F(1, 45) = 10.55$, $p = .002$ showed a significant effect. The free-throw performance in games was strongly predicted by the performance in training ($\beta = .78$, $p < .01$) indicating merely that there were stable individuals' differences in performance. More important, FNE contributed significantly ($\beta = -.28$ $p = .002$), suggesting that individuals with high levels of FNE performed worse in free-throws in actual basketball games than individuals with low levels of FNE, compared to free-throw performance in training.

Table 6

Multiple Regression Analysis of FNE on Game Performance

Condition	*B*	*SE B*	*β*	R^2	ΔR^2
Step 1				.60**	
Training	.86	.10	.78**		
Step 2				.68**	.08**
Training	.89	.09	.81**		
FNE	-.57	.76	- .28**		

Note. *B* = unstandardized coefficients; *SEB* = standard errors of unstandardized coefficients for the variables in the final regression equation; β = standardized coefficients; R^2 (ΔR^2) = cumulative (change in) variance accounted for at each step. Baseline performance (pretest) is controlled for at Step 1.

** $p < .01$.

Action orientation and task performance

We hypothesized that SO- Individuals will perform worse in a basketball free-throw task than AO-Individuals after the induction of pressure, but not in low-pressure condition. AO was uncorrelated with the baseline (pretest) performance, implying that AO- and SO- participants did not differ in their shooting accuracy before the induction of pressure. The main dependent variable was deterioration in performance from before to after the induction of pressure. A hierarchical multiple regression analysis was conducted on the posttest free-throw performance. To control for the covariate, training attendance was added as the first blocking variable because of its correlation with AOF ($r = -.26$, $p = .04$) indicating, that SO-individuals attend training more often than AO-individuals. Pretest performance was entered in a second step, and AOF was added in a third step. Results are shown in Table 7. Controlling the covariate training attendance showed an effect on the posttest performance ($R^2 = .13$, $F(1,63) = 9.47$, $p = .23$). Both the pretest free-throw performance, $\Delta R^2 = .22$, $\Delta F(1, 62) = 21.33$, $p < .01$ and the third step with AOF, $\Delta R^2 = .05$, $\Delta F(1, 61) = 5.59$, $p = .02$, showed a significant effect. The posttest free-throw performance was strongly predicted by the pretest score ($\beta = .52$, $p < .01$), indicating merely that there were stable individual differences in performance. More important, Action Orientation after failure (AOF) contributed significantly ($\beta = -.24$, $p = .02$), indicating that AO-individuals performed worse after the induction of pressure than SO-individuals.

Table 7

Multiple Regression Analysis of AOF on Posttest

Condition	*B*	*SE*	*β*	R^2	ΔR^2
Step 1				.13**	
Attendance	.07	.02	.36**		
Step 2				.34**	.22
Attendance	.04	.02	.20		
Pretest	.59	.13	.50**		
Step 3				.38**	.05
Attendance	.03	.02	.13		
Pretest	.61	.12	.52**		
AOF	-.04	.02	-.24*		

Note. *B* = unstandardized coefficients; *SEB* = standard errors of unstandardized coefficients for the variables in the final regression equation; β = standardized coefficients; R^2 (ΔR^2) = cumulative (change in) variance accounted for at each step. Baseline performance (pretest) is controlled for at Step 2.

* p < .05, ** *p* < .01.

Another hierarchical multiple regression analysis was conducted on the self-reported free-throw performance in games. In the first step the free-throw performance in training was entered as a blocking variable and AOF was added in a second step. Results can be seen in Table 8. The first step with the training free-throw performance, $R^2 = .60$, $F(1,46) = 69.95$, $p < .01$, showed a significant effect whereas and the second step with AOF , $\Delta R^2 = .00$, $\Delta F(1, 45) = 0.12$, $p = .91$ did not contribute as a predictor. The free-throw performance in games was strongly predicted by the performance in training (β = .78, $p < .01$). Results show that individuals' disposition towards AO or SO had no effect on free-throw performance in actual games.

Table 8

Multiple Regression Analysis of AOF on Game Performance

Condition	*B*	*SE*	*β*	R^2	ΔR^2
Step 1				.60**	
Training	.86	.10	.78**		
Step 2				.60**	.00
Training	.86	.10	.78**		
AOF	-.06	.55	-.01		

Note. *B* = unstandardized coefficients; *SEB* = standard errors of unstandardized coefficients for the variables in the final regression equation; β = standardized coefficients; R^2 (ΔR^2) = cumulative (change in) variance accounted for at each step. Baseline performance (pretest) is controlled for at Step 1.

** $p < .01$.

Discussion

The study's aim was to examine the effect of pressure and personality on sport performance. More specifically, we investigated whether FNE and action orientation would moderate free-throws performance in a high-pressure situation.

We predicted, that the induction of pressure would decrease overall free-throw performance. The present results confirm this expectation. These findings are in line with choking literature (e.g. Cao et al., 2011) which found that performance declines as pressure increases. We successfully used the TSST to induce cognitive and somatic anxiety and to reduce self-confidence in the high-pressure condition. Despite the fact, that the TSST is one of the most popular and standardized methods used in experimental settings to induce a robust stress response (Kirschbaum et al., 1993), it has primarily been used in cognitive performance tasks. In our study the participants were basketball players who regularly participate in competitions. Results showed an increase in cognitive and somatic anxiety and we did find a decrease in performance. In a study (Mascret et al., 2016) similar to ours, the TSST was also used to induce pressure in a basketball free-throw task. Participants were novice basketball players but trained sportsmen and were exposed to two counterbalanced conditions, either the TSST was used to induce pressure or a Placeboo-TSST. Results of physiological and psychological measures indicate that the TSST induced a significant stress response, whereas the Placeboo-TSST did not. However, they did find that free-throw performance remained stable after the TSST but decreased after the Placeboo-TSST. We conclude that the TSST is a suitable tool to induce cognitive and somatic stress in in sport performance. Future studies should extend the use in different settings such as with different levels of expertise, different sports and with an interdisciplinary approach to discern the underlying processes (Mascret et al., 2016). As for our study, the TSST has proven to be a reliable tool to induce somatic and cognitive pressure as well as to reduce self-confidence.

We further predicted that individuals with high levels of FNE would perform worse after the induction of pressure than individuals with low levels of FNE. Present results do only partly confirm the expectation. There were no differences in free-throw performance in the low-pressure condition. Surprisingly, there were also no differences in the high-pressure condition. In our task, athletes with high levels of FNE did not differ in their free-throw performance under pressure from athletes with low levels of FNE. However, we did find differences in free-throw performance based on the athletes self-reported free-throw average from last season during training (i.e. low-pressure situation) and during games (i.e. high-pressure situation). Results indicate, that athletes with high levels of FNE performed worse in games

(i.e. real-life scenarios) than athletes with low scores of FNE. These additional findings are consistent Geukes et al. (2017) findings which also tested the effect of FNE in real-life scenarios. Past work (Geukes et al., 2017; Mesagno et al., 2012) has shown that higher levels of FNE lead to higher anxiety levels, thus leading to decreased performance in high-pressure situations. Our results do not confirm their findings but extend the discussion about the mechanism of FNE and the effect on sport performance and anxiety. In our study, high levels of FNE was uncorrelated with higher levels of cognitive or somatic anxiety in high-pressure situations. FNE did however correlated with lower levels of self-confidence. We also found that higher levels of FNE was correlated with increased cognitive and somatic anxiety, and lower self-confidence in low-pressure condition. One explanation for the unexpected missing effect of FNE on our free-throw performance task, could be that athletes high in FNE may be safeguarded against choking. Analogous to Baumeister's (1984) self-consciousness argument, athletes high in FNE may be used to heightened anxiety levels. Our finding with the increased anxiety levels in the low-pressure condition support this explanation. Still, we could show a moderating effect of FNE and free-throw performance in real life. We could show, that individuals with high levels of FNE performed worse in free-throws during regular games of last season than individuals with low levels of FNE. A possible explanation for this might be the public setting. When shooting free-throws in a game, athletes are observed by their coaches, team mates and the audience. Individuals with FNE might be more aware of their surroundings and become more concerned about being judged negatively if they miss their shoots. Thus, they focus their attention to task irrelevant thoughts which leads to distraction and thus choking under pressure (e.g. Oudejans et al., 2011; Mesagno et al., 2012; Roberts at al., 2017). It is also possible, that in real-life situations, athletes with FNE would show increased levels of anxiety, which we did not measure in this study. It remains a challenge for future researchers to find and investigate additional factors which causes the athletes with high levels of FNE to choke in actual game situations (i.e. real-life scenarios) but not in semi-laboratory settings. Also, future research should focus to find ways to measure cognitive and somatic anxiety, as well as self-confidence, in real-life pressure conditions, such as in actual games without interrupting the process.

We also hypothesized that SO- individuals would perform worse in a free-throw task under pressure than AO-individuals. While there were no differences in free-throw accuracy in the low-pressure condition, differences emerged in the high-pressure condition. Astonishingly, the present results indicate, that SO- individuals perform better in the free-throw shooting task under pressure than AO- individuals. While the free-throw accuracy of AO-athletes declined, SO-athletes accuracy remained stable. Thus, AO- players were especially prone to choking under pressure. We also did not find an effect supporting the moderating role of AO

during free-throw performance in games during last season. The behavior of AO- and SO-athletes shown in this study is not consistent with previous research (Heckhausen & Strang, 1988; Jaramillo & Spector, 2004; Koole & Jostmann, 2004, Kuhl, 1984) in regard of action orientation and sport performance. Past works have found that after the induction of a negative affect such as failure, anxiety or self-focus, AO-individuals were much faster in down-regulating their affective and physiological state in order to focus on the task at hand, rather than SO- individuals. In our study, affect regulation was measured through the posttest performance, indicating that SO- individuals were faster in down-regulating their negative affective state which lead to increased free-throw accuracy. Since our findings are contrary to previous research, we do not have an explanation for the beneficial effect of SO in sport performance under pressure. According to Koole and Jostmann (2004) it may be possible that the down-regulation of the affective mood from AO- individuals is not so much apparent immediately after the induction of pressure but rather grows over time. Thus, in future research, free-throw performance could be measured three minutes, five minutes, and ten minutes after the induction of pressure. Some authors (Koole et al., 2005) have argued that extreme amounts of stress may even exceed the affect-regulation abilities of chronically AO-individuals which leads to SO-behavior. In our study there was a significant increase in cognitive and somatic anxiety and a significant decrease in self-confidence, compared to the baseline condition. However, it is unclear whether the definition of "extreme amounts of stress" (p.221) mentioned by the authors was met. It is possible that athletes who scored high in SO were used to the negative affect through the increased pressure, whereas athletes with high scores in AO struggled to up-regulate their affect under this "extreme amounts of stress".

Alternative explanation for the worsened performance of AO- participants may be that SO- players are more aware of their disposition towards SO- behavior and are thus actively participating in corrective actions. We found a correlation between SO- participants and training attendance, suggesting that SO- individuals would attend training more often than AO-individuals. Still it remains a challenge to explain our findings. Future researchers should replicate our study with a different sample to see whether they find similar results.

Limitations

The present study could only partly support our hypothesis in regard to the moderating role of FNE and AO on sport performance under pressure. One limitation of the experimental manipulation might be the explicit stating that the players will participate in high-pressure condition. It is possible, that the reported felt anxiety (on the MRF-3) was due to the awareness that they were supposed to feel pressure, rather than the experimental manipulation through the TSST. Thus, it is possible that the subsequent self-reports of anxiety were

influences by apparent experimenter expectations (Otten, 2009). However, studies suggest (e.g. Leith, 1988) that choking is more likely to occur when openly talked about.

One strength is the semi-laboratory setting of this study. We were able to test players free-throw performance in a familiar environment which is very close to the real-life setting. However, we could not control for all factors. The 15-minute warm-up was instructed by the coach of the team. Even though the trainer was told to use a regular warm-up routine, it is most likely that the intensity of the warm-up differed between the teams. Also, the first players completing the baseline condition had less time to warm-up than the players following. On the other side, players completing the low-pressure condition returned to regular training, so when they returned for the high-pressure condition, they might have been more depleted. There may be other individual variable which we did not measure, that may have influenced performance such as pre-shooting routine (Gooding & Gardner, 2009; Mesagno et al., 2008; Mesagno & Mullane-Grant, 2010) and preparation time before each shot (Jordet, 2009; Jordet & Hartman, 2008). Future research should focus whether such variables could better predict free-throw performance under pressure, and whether individuals with different levels of FNE or different disposition towards either AO or SO differ.

Some of our findings in regard to the moderating role of FNE on sport performance is based on self-reported measures. Athletes were asked to state their free-throw average during training and games from last season. While some teams would have been able to provide the empirical date, all participants estimated the average by them self. Even though our findings are in line with current research (e.g. Geukes, 2017) that FNE moderates free-throw performance in real-life, it should be noted as a limitation.

Conclusion

Athletes who are unable to deal with stressful circumstances may experience psychologically damaging effects such as under-achieved sporting potential, increased social anxiety, diminished enjoyment, lowered well-being, impaired self-identity and increased dropout from sport (e.g. Hill, Hanton, Matthews & Fleming, 2011; Mesagno, Harvey & Janelle, 2012). In the current study we wanted to examine the effects of pressure and personality on athlete's basketball free-throw performance. We tested whether FNE and the disposition towards AO would moderate their performance. As predicted, we found that performance decreased under pressure. Against our expectations, our results suggest no evidence for the moderating role of FNE. However, we did find significant evidence for the moderating role of FNE in real game settings, based on self-reports. Players with high levels of FNE performed worse in free-throw shooting during games from last season, than athletes with low levels of FNE. Surprisingly, and against our expectations, we did find, that athletes with a disposition towards SO

performed better under pressure, then AO-individuals. This finding may appear surprising because previous studies showed different results, supporting our hypothesis (e.g. Gröpel, 2015; Heckhausen & Strang, 1988). With our results, we challenge the notion, that AO-individuals are generally superior to SO-individuals at skilled motor-performance under pressure. We would even suggest, that a mix of AO- and SO-players is beneficial for a sports team. Thus, under different kind of pressure, athletes with different dispositions towards either AO or SO may be helpful. Also, the SO-individuals sensitivity to risk-taking may counteract the AO-team mates' tendency towards excessive optimism and decision making (Koole et al., 2005; Raab & Johnson, 2004).

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Appendices

Appendix A: List of Tables

Appendix B: Measures

Demographics

ID: _____

1) Sind Sie Links oder Rechtshänder?	□ Linkshänder □ Rechtshänder
2) Alter	……
3) Geschlecht	□ Mann □ Frau
4) Wie lange spielen Sie schon Basketball?	…… (in Jahren)
5) Welche Position spielen Sie?	……..
6) Nummer von Trainings per Woche?	……
7) Was war die höchste Liga in der Sie je gespielt haben?	……..
8) In welcher Liga haben Sie in der letzten Saison gespielt?	……..
9) Wie hoch war Ihre Freiwurfquote **im Spiel** in Ihrer letzten Saison?	……%
10) Wie hoch war Ihre Freiwurfquote **im Training** in Ihrer letzten Saison?	……%

HAKEMP-90

ID: _____

Bitte kreuzen Sie zu jeder Frage immer diejenige der beiden Antwortmöglichkeiten (*a* oder *b*) auf dem Antwortbogen an, die für Sie eher zutrifft.

(1) **Wenn ich etwas Wertvolles verloren habe und jede Suche vergeblich war, dann**

a) kann ich mich schlecht auf etwas anderes konzentrieren.
b) denke ich nicht mehr lange darüber nach.

(2) **Wenn ich weiß, daß etwas bald erledigt werden muß, dann**

a) muß ich mir oft einen Ruck geben, um den Anfang zu kriegen.
b) fällt es mir leicht, es schnell hinter mich zu bringen.

(3) **Wenn ich vier Wochen lang an einer Sache gearbeitet habe und dann doch alles mißlungen ist, dann**

a) dauert es lange, bis ich mich damit abfinde.
b) denke ich nicht mehr lange darüber nach.

(4) **Wenn ich nichts Besonderes vorhabe und Langeweile habe, dann**

a) kann ich mich manchmal nicht entscheiden, was ich tun soll.
b) habe ich meist rasch eine neue Beschäftigung.

(5) **Wenn ich bei einem Wettkampf öfter hintereinander verloren habe, dann**

a) denke ich bald nicht mehr daran.
b) geht mir das noch eine ganze Weile durch den Kopf.

(6) **Wenn ich ein schwieriges Problem angehen will, dann**

a) kommt mir die Sache vorher wie ein Berg vor.
b) überlege ich, wie ich die Sache auf eine einigermaßen angenehme Weise hinter mich bringen kann.

(7) **Wenn mir ein neues Gerät versehentlich auf den Boden gefallen und nicht mehr zu reparieren ist, dann**

a) finde ich mich rasch mit der Sache ab.
b) komme ich nicht so schnell darüber hinweg.

(8) **Wenn ich ein schwieriges Problem lösen muß, dann**

a) lege ich meist sofort los.
b) gehen mir zuerst andere Dinge durch den Kopf, bevor ich mich richtig an die Aufgabe heranmache.

(9) **Wenn ich jemanden, mit dem ich etwas Wichtiges besprechen muß, wiederholt nicht zu Hause antreffe, dann**

a) geht mir das oft durch den Kopf, auch wenn ich mich schon mit etwas anderem beschäftige.
b) blende ich das aus, bis die nächste Gelegenheit kommt, ihn zu treffen.

(10) **Wenn ich vor der Frage stehe, was ich in einigen freien Stunden tun soll, dann**

a) überlege ich manchmal eine Weile, bis ich mich entscheiden kann.
b) entscheide ich mich meist ohne Schwierigkeit für eine der möglichen Beschäftigungen.

(11) **Wenn ich nach einem Einkauf zu Hause merke, daß ich zu viel bezahlt habe, aber das Geld nicht mehr zurückbekomme,**

a) fällt es mir schwer, mich auf irgend etwas anderes zu konzentrieren.
b) fällt es mir leicht, die Sache auszublenden.

(12) **Wenn ich eigentlich zu Hause arbeiten müßte, dann**

a) fällt es mir oft schwer, mich an die Arbeit zu machen.
b) fange ich meist ohne weiteres an.

(13) **Wenn meine Arbeit als völlig unzureichend bezeichnet wird, dann**

a) lasse ich mich davon nicht lange beirren.
b) bin ich zuerst wie gelähmt.

(14) **Wenn ich sehr viele wichtige Dinge zu erledigen habe, dann**

a) überlege ich oft, wo ich anfangen soll.
b) fällt es mir leicht, einen Plan zu machen und ihn auszuführen.

(15) **Wenn ich mich verfahre (z. B. mit dem Auto, mit dem Bus usw.) und eine wichtige Verabredung verpasse, dann**

a) kann ich mich zuerst schlecht aufraffen, irgendetwas anderes anzupacken.
b) lasse ich die Sache erst mal auf sich beruhen und wende mich ohne Schwierigkeiten anderen Dingen zu.

(16) **Wenn ich zu zwei Dingen große Lust habe, die ich aber nicht beide machen kann, dann**

a) beginne ich schnell mit einer Sache und denke gar nicht mehr an die andere.
b) fällt es mir nicht so leicht, von einer der beiden Sachen ganz Abstand zu nehmen.

(17) **Wenn mir etwas ganz Wichtiges immer wieder nicht gelingen will, dann**

a) verliere ich allmählich den Mut.
b) vergesse ich es zunächst einmal und beschäftige mich mit anderen Dingen.

(18) **Wenn ich etwas Wichtiges, aber Unangenehmes zu erledigen habe, dann**

a) lege ich meist sofort los.
b) kann es eine Weile dauern, bis ich mich dazu aufraffe.

(19) **Wenn mich etwas traurig macht, dann**

a) fällt es mir schwer, irgendetwas anderes zu tun.
b) fällt es mir leicht, mich durch andere Dinge abzulenken.

(20) **Wenn ich vorhabe, eine umfassende Arbeit zu erledigen, dann**

a) denke ich manchmal zu lange nach, womit ich anfangen soll.
b) habe ich keine Probleme loszulegen.

(21) **Wenn einmal sehr viele Dinge am selben Tag mißlingen, dann**

a) weiß ich manchmal nichts mit mir anzufangen.
b) bleibe ich fast genauso tatkräftig, als wäre nichts passiert.

(22) **Wenn ich vor einer langweiligen Aufgabe stehe, dann**

a) habe ich meist keine Probleme, mich an die Arbeit zu machen.
b) bin ich manchmal wie gelähmt.

(23) **Wenn ich meinen ganzen Ehrgeiz darin gesetzt habe, eine bestimmte Arbeit gut zu verrichten und es geht schief, dann**

a) kann ich die Sache auf sich beruhen lassen und mich anderen Dingen zuwenden.
b) fällt es mir schwer, überhaupt noch etwas zu tun.

(24) **Wenn ich unbedingt einer lästigen Pflicht nachgehen muß, dann**

a) bringe ich die Sachen ohne Schwierigkeiten hinter mich.
b) fällt es mir schwer, damit anzufangen.

FNE-K

Furcht vor negativer Evaluation - Kurzskala (FNE-K[1])
(engl. Brief fear of negative evaluation - revised, BFNE-R[2])

Bitte lesen Sie jede der folgenden Feststellungen aufmerksam durch und geben Sie durch Ankreuzen auf der angegebenen Skala an, wie charakteristisch diese ihrer Meinung nach für Sie ist.

1 = überhaupt nicht charakteristisch für mich, 2 = ein bisschen charakteristisch für mich, 3 = einigermaßen charakteristisch für mich, 4 = sehr charakteristisch für mich, 5. äußerst charakteristisch für mich

		1	2	3	4	5
1.	Ich mache mir Gedanken darüber, was andere Leute von mir denken, auch wenn ich weiß, dass es egal ist.	O	O	O	O	O
2.	Es bekümmert mich wenn ich merke, dass andere Leute einen schlechten Eindruck von mir bekommen.	O	O	O	O	O
3.	Ich habe oft Angst, dass andere Leute meine Fehler bemerken.	O	O	O	O	O
4.	Ich mache mir öfters Gedanken darüber, welchen Eindruck ich auf jemand anderes mache.	O	O	O	O	O
5.	Ich habe Angst, dass andere sich nicht positiv über mich äußern.	O	O	O	O	O
6.	Ich habe Angst, dass andere Leute etwas an mir auszusetzen haben.	O	O	O	O	O
7.	Die Meinung anderer Leute über mich ist mir wichtig.	O	O	O	O	O
8.	Wenn ich mit jemandem spreche, mache ich mir Gedanken darüber, was der andere über mich denken könnte.	O	O	O	O	O
9.	Normalerweise mache ich mir Gedanken darüber, wie ich auf andere wirke.	O	O	O	O	O
10.	Es macht mir etwas aus wenn ich weiß, dass mich jemand beurteilt.	O	O	O	O	O
11.	Manchmal glaube ich, ich beschäftige mich viel zu sehr damit, was andere Leute von mir denken.	O	O	O	O	O
12.	Ich habe oft Angst, dass ich etwas Falsches sagen oder tun würde.	O	O	O	O	O

[1] Reichenberger, J., Schwarz, M., König, D., Wilhelm, F. H., Voderholzer, U., Hillert, A., & Blechert, J. (2016). Angst vor negativer sozialer Bewertung: Übersetzung und Validierung der Furcht vor negativer Evaluation - Kurzskala. *Diagnostica, 62*, 169 – 181.

[2] Carleton, R. N., McCreary, D. R., Norton, P. J., & Asmundson, G. J. (2006). Brief fear of negative evaluation scale - revised. *Depression and Anxiety, 23*, 297-303.

TSST

Stressinduktion Mathe (zweiter Teil des TSST)

The task: to subtract the number 13 from 1,022 in the next five minutes

Instruction: "During the five minute you will be asked to sequentially subtract the number 13 from 1,022. You will verbally report your answers aloud, and be asked to start over from 1,022 if a mistake is made. Your time begins now."

If the participant makes a mistake, prompt them with: "That is incorrect, please start over from 1,022."

Set a digital timer for 5 minutes.

Correct responses:

1,022	749	476	203
1,009	736	463	190
996	723	450	177
983	710	437	164
970	697	424	151
957	684	411	138
944	671	398	125
931	658	385	112
918	645	372	99
905	632	359	86
892	619	346	73
879	606	333	60
866	593	320	47
853	580	307	34
840	567	294	21
827	554	281	8
814	541	268	
801	528	255	
788	515	242	
775	502	229	
762	489	216	

MRF-3

ID: _____

Instruktion: Setze ein Kreuz auf der Linie um zu verdeutlichen, wie Sie sich gerade fühlen.

GELASSEN _____ BESORGT

ENTSPANNT _____ ANGESPANNT

SICHER _____ UNSICHER

T1

GELASSEN _____ BESORGT

ENTSPANNT _____ ANGESPANNT

SICHER _____ UNSICHER

T2

Free-throw score

Baseline ID

Wurf/Punkte	6	5	4	3	2	1
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

high-pressure situation ID

Wurf/Punkte	6	5	4	3	2	1
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

6 = clean basket

5 = rim-and-in

4 = backboard-and-in

3 = rim-and-out

2 = backboard-and-out

1 = complete miss

Appendix C: Deutsche Zusammenfassung

Im Sport kommt es immer wieder zu Situationen, an denen Sportler trotz großen Drucks ihr Bestes geben müssen. In unserer Studie haben wir erwartet, dass sich die sportliche Leistung unter Druck verschlechtern würde und dass die Leistung von Personen mit einer erhöhten Angst vor negativer Beurteilung stärker nachlässt, als die von Personen mit geringerer Angst. Es wurde ebenfalls vermutet, dass sich Sportler, die eher lageorientiert waren, stärker verschlechtern würden, als Sportler die handlungsorientiert sind. Wir haben erfahrene Basketballspieler ($N = 67$) getestet, welche 15 Freiwürfe unter normalen Umständen (Baseline) und 15 Freiwürfe unter Druck geworfen haben. Der Druck wurde durch eine adaptierte Version des TSST induziert. Wie erwartet fanden wir, dass sie die allgemeine Freiwurfleistung unter Druck verschlechterte. Bei unserem Versuch fanden wir, dass Angst vor negativer Beurteilung keinen Effekt auf die Leistung hatte. Dennoch fanden wir, dass es einen Effekt auf die Freiwurfleistung in Spielen der vergangenen Saison hatte. Entgegen unserer Vorhersage fanden wir außerdem, dass lageorientiert Spieler unter Druck eine stabilere Leistung zeigten, währenddessen die Leistung handlungsorientierter Spieler abnahm. Die Unterschiede lassen sich nicht auf erhöhten kognitiven und somatischen Stress zurückführen, noch auf eine Verminderung des Selbstsicherheitsgefühls. Unsere Ergebnisse erweitern bisherige Forschung zu der moderierenden Rolle von Persönlichkeitsmerkmalen und Leistungsversagen im Sport.

Schlagwörter: Angst vor negative Beurteilung, Handlungsorientierung, Versagen motorischer Fähigkeiten, Versagen unter Druck