

'Being Anxious' and Kinematics Putting Performance: A Phenomenological Case Report

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Abstract: Introduction. Golf putting requires accurate and repeatable stroke especially under pressure (e.g., audience presence, ego-relevance of the task). The performance-anxiety relationship has been frequently studied, but the underlying mechanisms still remain inconclusive. Phenomenology insists that psychology should focus on meaning and investigate the essence of human experience. This paper examines the experience of 'being anxious' and the putting performance issues reported by an elite golfer under pressure. Methods. An Italian professional golfer refers alteration in putting performance (e.g., lack consistency stroke) and low ability to manage unexpected events. Case design consists in: evaluation session conduct by psychologist; experimental phase into we recoding kinematics putting performance by SAM PuttLab System. Conclusions. For player, putting analysis shown an unexpected improvement of performance in stressful situations than other sessions. A possible interpretation of these results takes into account to the personal experience of 'being anxious', to overcoming the subject-object dichotomy. Indeed, anxiety is not in the head, but it can be understood only within the life of sport performers. I believe that the phenomenological framework and quantitative analysis could be offer a new way of study, learning and teaching in sport psychology.

Keywords: Putting Performance, Anxiety, Sport Psychology, Sport Sciences, Phenomenology, Kinematic Movement

1. Introduction

A successful golf performance requires more than a good swing, it depends on skills in iron play, wood play, short game, and putting [1]. The golf course could be representing a threat with unexpected events and environmental conditions that could make worse or better gaming opportunities.

Putting is considered one of the critical elements and the most important factor for scoring of professional player [2]. Coordination, rhythm and timing are important components for consistency, feel [3] and fluency. Putting movement experience is rich and various, and it requires many forms of self-focus and self-awareness. Notoriously, different players can respond to similar situation in distinct ways.

It is documented that competitive pressure elicits effects on physiology, motivational and emotional processes (e.g., anxiety), and kinematic responses [4, 5]. When performance falls below standards during competition, this is often referred to as 'choking under pressure'. [6] Defined pressure

as "a factor, or combination of factors, that increases the importance of performing well on a particular occasion". An alternative empirically definitions supported choking in sports as a process whereby the individual perceives that resources are insufficient to meet the demands of the situation, and concludes with a significant drop in performance [7, 8]. The literature often recognizes the role of anxiety as an indicator for perceived pressure in some given situations [9]. Most studies investigating the mechanisms underlying the anxiety-performance relationship concentrate on the final frame of task execution, that is, the execution of goal-directed movement. For example, higher levels of state anxiety have been found to be associated with a decrease in kinematics accuracy and consistency [10], and a lower motivation and mental toughness [11, 12]. However, the pressure-performance relationship is not only negatively biased. Recent study shown that the state anxiety can occasionally improve performance (*clutch performance*) [13, 14].

A clutch performance has been defined as "any performance increment or superior performance that occurs

under pressure circumstances" [13]. [4] Examined 50 expert golfers and their psychological, physiological, and kinematic responses during a golf putting task. Results shown that the high competitive pressure increased putting accuracy, anxiety, effort, and heart rate, but decreased grip force. [15] Examined 11 elite golfers who reported choking and clutch performances under pressure. The results shown who excelled under pressure reported: Lowering of expectations, a greater external focus on task-related cues, a greater focus on performance improvement in preference to winning, a perception that anxiety was helpful to their performance, and greater perceived control over their performance.

However, less is known about the subjective state experienced by athletes while excelling under pressure. According [16], investigations into anxiety and sport were influenced by Cartesian dualism that characterized cognitive theories and researchers tend to use cognitive behavioural techniques to help athletes manage symptoms. The anxiety response has been considered in terms of cognitive and somatic subcomponents and so, they do not understand the personal experience of being anxious and the what this means to him.

In recent years, there has an interest for application of phenomenology in sport psychology [16, 17, 19, 20, 21, 22, 23, 24, 25], because it seems only way to overcoming Cartesian mind-body dualism [16]. Phenomenology offers a new perspective; It considers the individual as unified people who form intentions and act in the world because our bodies work in certain ways [21, 26, 27]. Also, it considers subjectivity as essentially constitutive of the phenomenon to be explained.

According [21] phenomenology represents an attitude to research and to promote a contextual re-consideration of sport performance experience and a deeper understanding of how it actually feels to be an exercising body. The sporting body develops not only a cognitive understanding of training and performance but also an embedded corporeal, "fleshy" knowledge and memory. Therefore, the use of phenomenology approach could lead to acquisition of data would differ from much of the current perspective since it would reflect the "lived" of the athletes [16].

[28] Made a contribution to overcoming the subject-object dichotomy. He has defined the human being (*Dasein*), as 'being-in-the-world'. Human subject cannot be defined in isolation, because it is linked to the world across his encounter with things. However, the author has neglected the role of the human body [20] while, it is central topic for [26, 27]. Human experience is not something that we contemplate from some position outside the world, but itself part of that world (being-in-the-world), and one's own body is the standpoint from which all things are perceived and experienced [26, 27]. The body is the active agent defined in relation to situations and tasks. It defines a 'here' that in its turn is a laying down of the fundamental coordinates that anchor the active body in an object. Also, the body not only is in space but it inhabits space, and it is the active agent in relation to situations and tasks. Body intentionality appears

central in sport performance. Through our bodily intentionality we are not directed at things and entities but face situations and tasks.

Rejecting the Cartesian conception that evaluates the body as a machine permits human beings the opportunity to experience the depth that being a 'lived body' [25, 26, 27]. In a recent single case study of a Danish elite golfer, authors underline how working with phenomenological approach might to bridge the dualistic and rigid division of conscious vs unconscious. Authors describing the different ways in which the golfer experiences the physicality of her body during training. [19] suggest that the golfer's experience of the physicality of her body can be considered in relation to three possible dimensions of self-consciousness: a pre-reflective subject-related dimension, a reflective object-directed dimension and a pre-reflective performative dimension. The pre-reflective performative dimension is to be understood as a non-objectifying dimension of subjects' experience and, in the present case, appears central to how the golfer adjusts and reshapes her technical skills. The golfer exemplifies how a possible pre-reflective performative dimension reflects the overall 'feeling' of the moving body.

In view of the above considerations, the emotional states take on a different meaning. According [28], an emotional state is not in the head, but is rather the elementary manifestation of our being situated [29, 30]. We are 'thrown into' the world and a mood assails us [28]. For this reason, a particular emotional situation (e.g., anxiety) influence the way I perceive myself, and my action possibilities.

Latin etymology of the word '*e-motion*' means y to the '*motion from*' a certain context by means of the generation of a new set of possible actions and perceptions. E-motioning would thus appear to be a continual variation of modes of feeling situated and a new possibilities of action, rather than coming to as stimulus' reflex [30]. In golf performance, anxiety would thus appear to prefigure a range of possible actions and perceptions and, at the same time, the possibility that those actions might fail.

Consequently, as stated by [30] 'being emotionally situated corresponds to a tension which is born and which is continually renewed in the sphere of social and practical engagement but which, at the same time, reflects the story of the individual. The fundamental feature of emotioning comprise a mode of feeling refers to a situation. Emotions are atmospheres poured out spatially that move the felt (not the material) body. 'Being emotionally' situated, it permits to orient the person in the world each and every time generating of action possibilities [29]. The e-moting is the embodied meaning of the ongoing situations.

So, phenomenological thought appears a new way that it might offer a descriptive and analytic insights into the study of sporting embodiment. Phenomenological analyses can promote a re-consideration of the essential structures of sporting and physical activity experience (e.g., corporeal and emotional experience).

To conclude, the use of phenomenology in sport psychology could to provide information originate by

practice rather than to employ constructs that researcher apply and measure in the field.

Adopting phenomenological psychology approach, we will examine how anxiety can be understood phenomenologically within the life of sport performers. The principal aim of this study is to examine, in depth, the issues reported by an elite golfer, his affective dispositional and his body awareness further to phenomenological approach. Indeed, we want analysis the kinematics movements changes in different under pressure conditions. We believe that the phenomenological framework and quantitative analysis could be offer a new way of study, learning and teaching in golf play world.

2. Methods

2.1. Participant

The participant was a 31 years-old male golfer who had been playing golf for 12 years. He was member of Professional Golfer Association of Italy (PGA). He agreed to participate in the present study because his golf putting performance was inconsistent and it threatens the achieve the best score during competition.

2.2. Apparatus and Materials

The confidential one-to-one psychology session was conducted by psychologist with hermeneutical-phenomenological approach. This strategy explores an 'event' through the narrative offered by those who have experienced it [31]. It follows a detailed descriptions of a human experience, within specific contexts. As a result, the approach can reveal the essence of how athlete felt under pressure.

The golfer reports some problems, such as lack putting consistency during competitions, low ability to manage different situation and unexpected events, inability to quiet himself, and low emotional awareness. From the player narrative appear low body and emotional awareness during the play events. Focusing is oriented on an external frame (e.g. contexts, persons, values) that it reduced the viscerality of the emotional states perceived (*Outwarness*). According [29, 30], subjects outward inclined will direct more attention to the other's expectations and they will seek to obtain confirmation. Focusing on an external frame, people reduced the viscerality of the emotional states perceived, bolstering the development of the cognitive dimension of emotions. This it also explains the sense of emptiness of the emotional states perceived by the person, or the sensation of being nothing which some of these persons may experience in relation to the loss of reference points which support the sense of one's continuity over time [29, 30]. For example, golfer could feel sensation of being nothing if his/her final score doesn't reflect expectations.

2.3. Golf Kinematic Analysis

The study was conducted on an indoor putting green (1.22 x 5.05 m). The putting strokes were measured using a three-

dimensional kinematic ultrasound system (SAM PuttLab system, Science & Motion Sports GmbH). The SAM PuttLab is based on high precision ultra-sound technology. A triplet with three ultrasound transmitters, which emitted signals to a base unit, was attached to the putter. The system was calibrated according to the user manual, and data were processed and analysed using the SAM Putt Ware Pro version 1.1 software. The overall sampling frequency is 210 Hz. The weight of the triplet, which is mounted onto the putter shaft, amounts to 48 g. The resolution of the system is 0.1 mm and 0.1 degrees [3]. A powerful feature of the PuttLab is the real-time feedback of performance. The consistency score of player is comparing with putting stroke parameters of the European Tour golfer's data.

3. Procedure

The study conformed to the national guidelines and regulations of the A. I. P. (Italian Association of Psychology). Participant gave informed consent.

Athlete used his standard golf putter to putt golf balls to a standard size hole (10.80 cm). Participant attended individual practice sessions, which began with a pre-test of 10 putts. No instructions were provided about how to putt. After the practice session, participant was required to make seven putts and to drive the ball into hole. During second test block (T_2) player was encouraged to perform seven consistency putts at 4-meter distance and the experimenter informed him that his performance will be compared with those of PGA Pro. Third test block has provided the same request of T_2 , but to further increase pressure, we introduced the presence of an unexpected audience. The player was presented as one of the best putters on the PGA Tour. Finally, in fourth test block (T_4) the player was free to make seven putts without audience and instructions.

Study considered specifics data divided into the following points: *Aiming* (putter face angle describes the alignment of the putter face in relation to the intended target line). *Direction* (alignment of the putter face at impact, putter path direction at impact, and ball direction). *Putter Path and Spot* (path geometry and impact spot). *Launch* (dynamic loft and rise). *Movement dynamics* (rhythm and time).

4. Results

4.1. Face at Address

During pre-test, the putter head is slightly open and pointing right. This deviation results in a technical score of 98%. The repeatability of the aiming is very high (90%). Same situation was recorded in T_4 (96% technical score and 94% consistency). During the intervention phases (T_2 and T_3), the putter head is slightly pointing to the left, but the high consistency scores remain in both cases (83% T_2 and 94% T_3).

4.2. Direction

The ball direction is basically determined by the putter

face angle and the putter path direction at impact (Marquardt, 2007). Face angle is considered the strokes average shows a slightly open face in all four test. The average path direction at impact displays a left tendency. The opposite face direction is a compensation that it allows the ball to still go straight. The setup position and putter path in the backswing will determine where you will hit the ball on the face. The player shows highly consistent natural movement (85%) and impact spot (75%), only in T₃.

4.3. Putter Path and Spot

A natural path movement is slightly curved inside at begin

and end. Backswing is not shorter than forward swing. High consistency score is recoded in all block tests. However, player obtains the better impact spot consistency in T₃ (75%). The highly consistent impact spot corresponds to the smooth and consistent path.

4.4. Rhythm and Timing

In each trials the players exhibit a backswing time over range (600-700 ms). The backswing rhythm overtake the Tour average (>2.2), in all sessions. However, the impact time (range: 300-350) and the forward swing time (range: 800-900) are regular.

Table 1. Putting Statistics of golf player in four test blocks.

Parameter	Pre-test	Goal task	Public task	Post-test
Face at address (<i>M ± SD</i>)	.13° open ±.54	.13° closed ±.71	.23° closed ±.41	.23° open ±.39
Face at impact	1.06° open ± 1.69	1.55° open ±.78	1.29° open ±.44	1.66° open ±.38
Putter path Direction at impact	1.69° left ±.58	2.36° left ±.83	2.14° left ±.83	2.32° left ± 1.18
Face on path at impact	2.8° open	3.9° open	3.5° open	3.8° open
Backswing ratio	0.42	0.42	0.45	0.42
Horizontal Impact Spot (mm)	2.4 heel	0.3 toe	1.4 toe	6.6 toe
Vertical Impact Spot (mm)	8.3	11.5	14.1	14.1
Face Rotation in Impact Zone	1.1° open	1.6° open	1.3° open	1.7° open
Dynamic Shaft Angle	2.5° deloft	3.3° deloft	3.5° deloft	2.9° deloft
Vertical Angle of Attack	2.4° up	1.8° up	1.5° up	1.4° up
Effective Loft	0.5° positive	0.3° negative	0.5° negative	0.1° positive
Predicted Launch	0.9°up	0.1°up	0.1°down	0.4°up
Backswing Time (ms)	853	869	853	906
Time to Impact (ms)	364	372	364	363
Forward Swing Time (ms)	881	890	881	884
Backswing Rhythm	2.35	2.34	2.35	2.49
Impact Timing	0.41	0.42	0.41	0.41
Impact Speed (mm/s)	2153	2017	2100	2266

Notes: Vertical Impact Spot: Corresponds to a standard height of the putter of 2.5 cm. Impact Zone: ± 10 cm before and after impact position. Shaft and Rise Angle: As viewed from the frontal plane. Backswing Rhythm: Ratio of backswing time to time to impact. Impact Timing: Ratio of time to impact to forward swing time.

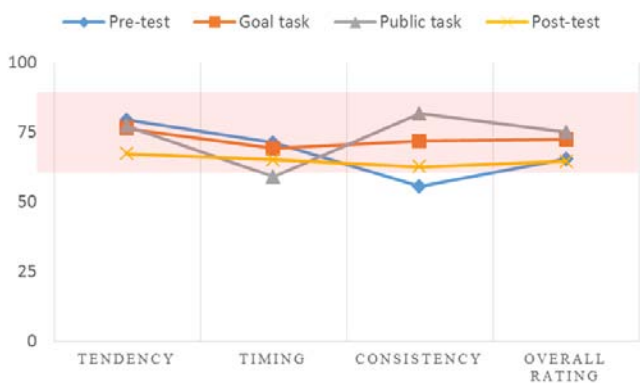


Figure 1. Summary profile of putting performance.

The overall scores (Figure 1) summarize the performance for the different aspects: Tendency – includes face at address, face at impact, path direction, face on path, impact spot and rotation at impact. Timing – includes time to impact, backswing timing, impact timing, path symmetry. Consistency – includes consistencies of face at address, face

at impact, path direction, path length, face on path, impact spot, rotation at impact, backswing time, impact time, impact velocity. Overall rating - summarizes technique (25%), timing (25%) and consistency (50%). Surprisingly, data suggest significant increase of performance consistency score in T₂ (72%) and T₃ (81.8%) than T₁ (55.6%) and T₄ (62.8%). Also, overall rating suggests a high putting performance in two test block under pressure.

4.5. Evaluation Session Post-Training

After the training session the player was interviewed with the psychologist during confidential one-to-one colloquium. The vision of data of performance was a strong feedback for player. The feedback has helping to improve body awareness and the meaning of golf experience.

5. Discussion

The preliminary case report examined the kinematics changes under pressure of elite golfer because high consistencies are more important for the skilled players.

Using a phenomenological approach, some themes are identifying as key factors for to understand the golf performance and to development individual training.

The initial player's narration appears inconsistent about his putting performance rather than the results. Indeed, the data shown a good performance in a two block test under pressure. By a text-context cycle it is possible understand meaning of behaviour into specific context.

The player displays an anxiety emotional state and pre-performance routine that his use as coping strategy to moderate arousal. Player had outward style of emotioning; his focus is oriented on an external frame and the emotional regulation depends from the interpretation of current situations. The subject will direct more attention to the other's expectations and he will seek to obtain confirmation. Indeed, the summary profile shown the best putting performance during goal and public task sessions.

The data shown a backswing time over range in each situations, whereas time to impact and forward swing time will remain under the value (threshold). These results underlying more cautions during stroke. The slow backswing rhythm, also, identify players with a cautions backswing who tend to control technique during the stroke. Rhythm and timing are generally guiding human movements, and consistent rhythm and timing are also crucial for high consistency of the complete stroke.

A phenomenological approach could be help for interpretation of these data. If an individual is in-a-world and emotional state is an elementary manifestation of our being situated, also the sporting movements must be considered into the world. According to Heidegger, we grasped meaning of golf performance only across a 'world' of references and meanings subjective. On this way, it is possible to see how the meanings ascribed on performance, not only referring to the isolate sport movement, but they arise from the golf, the field, the goals and the life projects of the players.

Finally, we think that the human bodily being-in-the-world is central in golf. Through motor intentionality golfer find the right solutions, the right distance, the optimal grip in relation to things and situations. Also, players need to be well balanced in vertical and horizontal fields for efficient golf actions. For this reason, it's important the awareness of the acting body.

6. Conclusion

The single case study indicates how working with phenomenological clarifications might serve to bridge the relatively dualistic and rigid division of mind vs. body, which seem to dominate in many of the psychology-oriented analysis of optimising the expertise of elite athletes.

In an applied perspective, phenomenology approach connected to quantitative movement analysis can provide a new theoretical and methodological framework to identify the first-persons golf experience and to focus upon the meaning of phenomena and personal acting body awareness. This new approach may inspire sport psychologists and coaches to create targeted golf training focused on athlete's

expertise in handling her body awareness.

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