

Accepted Manuscript of an article published in Sport Psychologist  
Cotterill, S., 2015. Preparing for performance: Strategies adopted across performance  
domains. Sport Psychologist, 29 (2), 158-170. Available online:  
<https://doi.org/10.1123/tsp.2014-0035>

1 Running Header: PREPARING TO PERFORM UNDER PRESSURE

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5 Preparing for performance: Strategies adopted across performance domains

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22

1 **Abstract**

2 The ability to prepare effectively to execute complex skills under pressure is crucial in a  
3 number of performance-focused professions. While there is emerging evidence of best  
4 practice little research has sought to compare preparation strategies across professions. As a  
5 result, the aim of this research was to explore the approaches employed within a number of  
6 professions and whether there are similarities in the techniques and strategies adopted.  
7 Participants were 18 ‘performers’, purposefully selected from sporting, musical, performing  
8 arts, and medical domains. Participants were interviewed individually to gain an  
9 understanding of each participant’s preparation strategies and the functions these strategies  
10 fulfilled. The data were thematically analyzed using interpretative phenomenological analysis.  
11 Results suggest that there are similarities in both behavioral and mental strategies adopted  
12 across professions. Future research should seek to explore the transferability of developmental  
13 approaches.

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15 Keywords: performance, pressure, preparation, mental skills

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1 from task irrelevant thoughts (Gould & Udry, 1994; Maynard, 1998); enhancing the recall of  
2 required physiological and psychological states (Marlow, Bull, Heath, & Shambrook, 1998);  
3 preventing performers focusing on the mechanics of the skill (Beilock & Carr, 2001; Mesagno  
4 & Mullane-Grant, 2010; Poolton, Maxwell, & Raab, 2008); and allowing performers to  
5 evaluate the performance conditions and calibrate the required responses (Schack, 1997).  
6 However, while many of these proposed functions appear intuitively appealing many of the  
7 studies these recommendations and proposals are built upon have been questioned regarding  
8 their design and applicability to real performance environments (Cotterill, 2010; Hazell et al.,  
9 2014). To date little research exploring the use of pre-performance preparation strategies has  
10 focused on the experience of the individual performer. Of the studies that exist only a small  
11 number have asked the performer about their experience, and the number of participants has  
12 always been limited. Cotterill (2011) presented a case study of two professional cricketers;  
13 Cotterill et al. (2010) interviewed six golfers; Jackson and Baker (2001) conducted a case  
14 study of one international rugby kicker; and Shaw (2002) presented a case study of a single  
15 professional golfer. As a result, further investigation of the strategies and techniques used is  
16 required.

17         The ability to perform under extreme pressure is a quality sought in many  
18 performance domains, whether in the military, law enforcement, emergency medicine,  
19 aviation, the performing arts, or sport (Vickers & Lewinski, 2012). Research conducted  
20 separately across these domains suggests that the same cognitive processes are at work to  
21 ensure that performers can execute their skills effectively under pressure (Burke, 2010;  
22 Cotterill, 2013). As a result, understanding effective preparation to perform under pressure  
23 across performance domains is crucial. Jordet and colleagues (Jordet, 2009; Jordet &  
24 Hartman, 2008) reinforced this view when conducting research into the preparation time and  
25 self-regulatory behavior of soccer players taking penalty kicks in international competitions.

1 They found that players who missed goals in the high-pressure situation had significantly  
2 faster preparation times and more escapist behavior (perhaps wanting to get the shot “over  
3 with”) than those who successfully scored a goal. This suggests that effective performance  
4 under pressure can be differentiated in the pre-performance period. This is further supported  
5 by studies that have focused on psychophysiological indicators during the pre-performance  
6 period in sport. Results from a number of studies have highlighted psychophysiological  
7 differences in the pre-performance period when comparing good and poor performance  
8 (Boutcher & Zinsser, 1990; Cotterill & Collins, 2004; Radlo, Steinberg, Singer, Barba, &  
9 Melnikov, 2002). Differences are also found when comparing expert and non-expert  
10 performers (Kim et al., 2008). For example, professional pianists and academy of music  
11 students have been shown to differ significantly in the time spent planning for performance,  
12 highlighting the importance of developing an effective mental performance plan  
13 (Miklaszewski, 1989). All of which suggests that the pre-performance period is crucial in  
14 underpinning effective performance under pressure.

15       Effective preparation for performance is crucial in helping the individual cope with the  
16 pressures and stress of the performance context. The maintenance of an optimal psychological  
17 state during the pre-performance period in particular has been highlighted as a key factor  
18 determining performance (Kao et al., 2013). Arora, Sevdalis, Nestel et al., (2010) highlighted  
19 that the operating room can be a highly pressurized environment in which surgeons encounter  
20 various stressors, including technical complications, equipment failure, time pressures,  
21 distractions, evaluative threat, and performance anxiety. In this environment it has been  
22 suggested that effective preparation is crucial in determining the surgeon’s ability to cope  
23 with these stressors (Arora et al., 2010). In particular effective preparation has been suggested  
24 to enhance the surgeon’s ability to cope with evaluative pressure, time pressure, and  
25 distractions (Arora et al., 2010). Although many skills and attributes are required to become a

1 surgeon, the ability to make the most of these and apply them under pressure is clearly of  
2 critical importance (McGrath, Moore, Wilson, Freeman, & Vine, 2011). This concept has also  
3 been explored in sport with the impact of pre-performance routines on choking gaining  
4 particular attention (Hill, Matthews, Scott & Fleming, 2010; Mesagno & Mullane-Grant,  
5 2010)

6 While the importance of preparation to perform is recognized across a number of  
7 performance domains (Broomhead, Skidmore, Eggett, & Mills, 2012; Burke, 2010; Cotterill  
8 et al., 2010; Hammermeister et al., 2010) little research has considered the approaches  
9 adopted across professions. This is surprising due to the increasing body of literature  
10 highlighting potential links between different performance-focused professions. For example,  
11 a number of contemporary authors have suggested similarities between the military and sport  
12 psychology (De Wiggins, Hite, & Alston, 2010; Hammermeister, Pickering, & Lennox,  
13 2010). Indeed, while acknowledging differences in the magnitude of stressors similar  
14 preparatory techniques have been highlighted as being crucial in both domains (Janelle &  
15 Hatfield, 2008; Ward, Farrow, & Harris, et al., 2008).

16 Despite the fact that the preparation period has been highlighted as being important  
17 regarding performance under pressure (Vickers & Lewinski, 2012) there is still limited  
18 research that has explored the most effective strategies that can be employed, and almost none  
19 exploring the strategies adopted across different professions. Also, there continues to be very  
20 little research that seeks to explore preparation from the perspective of the performer. As a  
21 result, the aim of this research was to explore what approaches were utilized in preparing to  
22 perform in specific domains, and consider whether these approaches could be successfully  
23 transferred across performance domains.

## 24 **Method**

### 25 **Participants**

1           A homogenous sample was purposively selected for this study. This specific approach  
2 was adopted in accordance with Smith and Osborn's (2003) guidelines for interpretative  
3 phenomenological analysis (IPA). The participants were selected based upon their experience  
4 as performers in the following four performance domains: sport, performing arts (acting),  
5 music (classical), and medicine (surgery). There were 18 volunteering participants as follows:  
6 five sports performers ( $M_{\text{age}} = 29$  years, age range: 25 to 35 years;  $M_{\text{experience}} = 16.25$  years  
7 range: 12.5 to 18 years); five performing artists ( $M_{\text{age}} = 31.4$  years, aged range: 21 to 45  
8 years;  $M_{\text{experience}} = 12.4$  years, range: 1 to 34 years); four musicians ( $M_{\text{age}} = 23.75$  years,  
9 range: 21 to 28 years;  $M_{\text{experience}} = 15$  years, range: 9 to 18 years); and four surgeons ( $M_{\text{age}} =$   
10 44.5 years, range: 39 to 52 years;  $M_{\text{experience}} = 14.75$  years, range: 9 to 20 years).

## 11 **Procedure**

12           The participants were interviewed to gain an insight into the approaches they adopted  
13 when preparing to perform in their particular performance domain. This study adopted a semi-  
14 structured interview approach as articulated by Smith and Osborn (2003) for conducting IPA  
15 research. The researcher developed a specific interview schedule for the study but this was  
16 used to guide rather than dictate the flow of the interviews. This approach is consistent with  
17 the phenomenological approach where the participants are considered the "experts" and it is  
18 the meanings that they associate with their experiences that is of interest to the researcher  
19 (Smith 1996). The specific process for developing the interview schedule adhered to the  
20 following four-step approach (Smith & Osborn, 2003) that involved the researcher: (a)  
21 thinking about a broad range of issues; (b) putting these topics in the most appropriate  
22 sequence; (c) thinking of appropriate questions relating to these areas; (d) and thinking about  
23 possible probes and prompts. Examples of interview questions include in this study include  
24 'How do you feel when you are preparing to perform?'; 'In what ways does the pressure of  
25 the situation impact upon your preparation?'; How do you ensure that you are always ready to

1 perform at optimal levels?'. All the interviews, which lasted between 30 and 80 minutes, were  
2 recorded and transcribed verbatim to produce an accurate record of the conversations that  
3 took place. The interview transcripts were then returned to the participants to check the  
4 accuracy of the transcription process, after which IPA was used to describe the issues and  
5 meanings that were apparent from the participants' interviews. Ethical approval for the study  
6 was gained via the University Research and Ethics Committee at the Institution where the  
7 author was resident at the time of the study. All of the participants opted to take part in the  
8 study by giving their informed consent.

### 9 **Data analysis**

10 The data were analyzed using IPA. The aim of this approach is to gain an  
11 understanding of the phenomena from the participant's perspective (Nicholls, Holt & Polman,  
12 2005). As a new and developing approach to phenomenological inquiry, IPA provides a clear  
13 set of thorough and accessible guidelines. IPA is not a prescriptive methodology and allows  
14 for individuality and flexibility of approach (Cope, 2011; Smith & Eatough, 2006). IPA is,  
15 however, systematic in its procedures, but whilst "there is a basic process to IPA (moving  
16 from the descriptive to the interpretative), the method does not claim objectivity through the  
17 use of a detailed, formulaic procedure" (Brocki & Wearden, 2006, p.97). IPA is emphatically  
18 inductive and idiographic, starting with a detailed, nuanced analysis of one case and then  
19 moving to the meticulous analysis of subsequent cases (Cope, 2011).

20  
21 Through this process the researcher engaged in an "interpretative relationship with the  
22 transcript" (Smith & Osborn, 2003, p. 64). All transcripts were read a number of times so the  
23 researcher could become familiar with each participant's account. Initial notes were made in  
24 the left-hand margin annotating anything identified as interesting or significant. As this  
25 process continued the right-hand margin was used to document emerging theme titles. These

1 initial notes were then transformed into concise phrases capturing the qualities of the points  
2 annotated. The next step involved the researcher making connections between the emergent  
3 themes and researcher interpretations (Smith & Osborn 2003). As these connections were  
4 made a clustering of themes emerged. Checks were made with the original transcripts to make  
5 sure connections still worked with the primary source materials. This step led to the  
6 development of a coherent table of themes. Once the transcripts had been analyzed by this  
7 interpretative process a final table of super-ordinate themes was constructed. These super-  
8 ordinate themes were then translated into a narrative account where the analysis subsequently  
9 became more expansive.

10 A non-foundational approach to validity as advocated by Sparkes (1998), where  
11 relativism is not considered an issue, was adopted in this study, as a way to enhance the  
12 “trustworthiness” of the study (Lincoln & Guba 1985). This was achieved through the use of  
13 bracketing and member checking (Cotterill et al., 2010; Nicholls et al., 2005). Bracketing  
14 involved the researcher keeping a reflective diary to help “bracket” personal experiences and  
15 consider the influence of personal values. Member checking involved verbatim transcriptions  
16 of the interviews being returned to the participants to check for authenticity and accuracy.  
17 Once the analysis process began, the participants were also contacted to clarify meaning  
18 where required.

## 19 **Results and Discussion**

20 The IPA analysis of the data highlighted six super-ordinate themes, which have  
21 been used to form the basis of the subsequent discussion. These super-ordinate themes are  
22 presented in Table 1. and include: preparation components – physical, preparation  
23 components - mental, influencing factors, preparation function, mindset, and technique  
24 development.

### 25 **Preparation components – physical**

1           There was a general recognition by the participants in the study that normally their  
2 “preparation” involved some sort of specific and functional behaviors that were linked to the  
3 performance they were about to undertake. One example of this was participant six  
4 (Musician) who reflected that:

5           I find myself stretching my fingers a bit, and err so like knowing where my fingers are  
6 going so I, I struggle with some of my tuning occasionally so like making sure that I am  
7 picking out the notes, so when I get to play it I am confident of where I am putting my  
8 fingers, so . . . . err, so when I get there I would get my violin out check my bow, tune  
9 my violin up, then I would do a bit of scales, work my fingers out a bit then I might . . .

10 This was supported by participant ten (Athlete) who stated that:

11           I want my last glance at the target normally to be a long stare, or at least it appears to  
12 me that way, as I bring my eyes back to the ball I try and retain the image of where I am  
13 trying to send the ball. I keep that image in my mind, in my minds’ eye throughout the  
14 whole duration of the swing.

15           The inclusion of physical aspects to preparation was pretty consistent across the  
16 performance domains, even if the actual preparatory behaviors differed. There was a  
17 recognition with the participants across all of the professions that the feeling prior to  
18 performance was also important. If the performers felt physically ready there was, in their  
19 opinion, a greater likelihood of a successful performance outcome. For example participant  
20 two (Performing Artist) stated that:

21           You need to be able to reach that point where you feel that your mouth is working  
22 properly . . . . when you get tired as well with quite wordy lines you feel that you can’t  
23 speak properly and think that you really need to warm up your mouth at the last minute,  
24 but you know when you are not ready, it doesn’t ‘feel’ right.

25 This view was complemented by participant thirteen (Athlete) who reflected that:

1        Yeah, it [the feeling] is really strange to describe. Sometimes I get a feeling over a putt, if  
2        I feel comfortable then everything else just seems to fall into place. So again, the actual  
3        alignment is very important.

4        Linked to this notion of feeling is that of the rhythm of these movements, and how the  
5        movements felt in their execution and timing (Cotterill et al., 2010). The importance of  
6        rhythm was apparent for the participants in the study whose performance was characterized  
7        by rhythmic behaviors. For example participant eleven (Athlete) reflected that:

8            I use the one-two approach. Basically, it is because I find it a very good timing thing in  
9            putting . . . for me just like the ticking of a clock one . . two . . and also I find it good . .  
10          . . especially for say shorter putts, when you are feeling a little bit nervous.

11        This notion of feeling ready has been highlighted as being particularly important when  
12        considering self-efficacy beliefs relating to performance. One of the reasons self-efficacy  
13        levels are of particular interest is because research suggests that higher levels are associated  
14        with more successful performance outcomes (Lane, Hall, & Lane, 2004; Moritz, Feltz,  
15        Fahrbach, & Mack, 2000). A key factor highlighted by Hays, Thomas, Butt, and Maynard  
16        (2010) in influencing efficacy beliefs was the way that the performer felt. In particular, the  
17        impact that the feeling of the movements prior to performance had upon the individuals'  
18        confidence in their ability to perform the required task.

### 19        **Preparation components – mental**

20            While the physical aspects of preparation varied according to the particular demands  
21        of the task, there were similarities across professions in the mental preparation approaches  
22        adopted. Specific mental skills adopted by the participants from different professions in this  
23        study included positive self-talk, focusing strategies, visualization, and relaxation strategies  
24        such as controlled breathing, meditation, and yoga.

1 Positive self-talk was one of the techniques highlighted by participants as helping  
2 them to prepare for, and execute, their performance. One particular example of the use of  
3 positive or motivational self-talk was participant fourteen (Athlete) who reflected that when  
4 playing golf:

5 I sometimes say to myself 'you are going to get this one'. Sometimes I gee myself up  
6 with a few little positive prompts and phrases. I usually find that I play quite well when  
7 I am just really, shall we say, cruising through it really, and I just say to myself very  
8 simple things.

9 Self-talk strategies are based on the use of cues that are aimed at enhancing performance,  
10 through the activation of appropriate responses (Hatzigeorgiadis, Galanis, Zourbanos, &  
11 Theodorakis, 2014). The use of motivational self-talk in the current study during the  
12 preparation period is in line with the findings of Hatzigeorgiadis, Zourbanos, Galanis, and  
13 Theodorakis's (2011) meta-analysis of the self-talk literature. This analysis highlighted that  
14 for fine tasks instructional self-talk was more effective than motivational self-talk. However,  
15 for more gross tasks motivational self-talk was more effective. While instructional and  
16 motivational self-talk have been reported as being facilitative to performance contemporary  
17 sources are also questioning this claim (Tod, Hardy, & Oliver, 2011).

18 Another common set of techniques that were highlighted as important in preparing to  
19 perform related to providing a specific focus and helping concentration. Participant three  
20 (Performing Artist) highlighted:

21 I think the routine is focusing you in the warm-up, I would definitely say it is more  
22 mental than anything else, probably it is to do with . . . it is almost like a mantra some of  
23 it. You know it is about focusing on the right thing, so I suppose in a way it is stopping  
24 your mind whizzing off, the fact that the critics might write something about you, and  
25 you are going to be judged, and that.

1 Offering a slightly different perspective, participant five (Actor) highlighted how strategies to  
2 distract attention from the task can also be effective:

3 Yeah, this is interesting and this happens in the boy's dressing room. We have a big  
4 male dressing room, boys dressing room. Actually I have given it away there. We are  
5 aged from 24 to 64 in there and it is all about sharing the dressing room. It is all about  
6 camaraderie and we are all like five-year olds, swearing and being disgusting and  
7 irreverent, and it is all about a childish sense of ludicrousness. I think there is a very  
8 immature male banter that goes on which is hilarious and fun but in a way forms a bond  
9 between us all as we are about to go on and do this slightly ridiculous thing you know.

10 So there are displacement activities that go on for sure to trick the mind, to distract it.

11 The use of the pre-performance period to ensure an effective attentional focus, as highlighted  
12 in this study, is consistent with research that has focused on the development and  
13 implementation of pre-performance routines. The need to develop an effective attentional  
14 focus has been highlighted as fundamentally important by Cotterill et al. (2010) in their case  
15 study of elite golfers. This attentional function to preparation is also consistent with other  
16 research that has focused on the function of the pre-performance period, and in particular the  
17 routines and strategies adopted (Cotterill, 2011; Czech et al., 2004, Harle & Vickers, 2001).

18 Visualization was also seen as a key skill that could be used to prepare for the up-  
19 coming performance, or indeed the performance environment. Participant four (Actor)  
20 reflected that:

21 What I do really is visualization, It is something that really helps you, just before you go  
22 on your heart goes bang bang bang bang, mine does, for that I close my eyes and  
23 imagine a flame and just very consciously pull it back into a calmer, you know pull  
24 myself back into a calmer place, and that has really really worked for me in the last  
25 year. That is sort of a fairly recent discovery,

1 A slightly different perspective on imagery use was offered by participant twelve (Athlete):

2 I visualize the actual trajectory of the shot right up to it landing on the green. I am not . .

3 . I don't spend a lot of time trying to feel it I must say, I am more visual in a way, I see

4 it rather than feel it.

5 These two quotes taken from sport and performing arts highlighted a difference in how

6 imagery/visualization was perceived. This supports the findings of Nordin and Cumming

7 (2005) in highlighting the different uses of imagery for performing artists compared to sport.

8 This is also supported by Hays (2002) who highlighted both similarities and distinct

9 differences in the use and conceptualization of imagery between sport and performing arts. In

10 the current study parallels could be drawn between performing artists and musicians in their

11 interpretation of imagery. Similarly, parallels could also be drawn between sport and surgery.

12 This suggests there might be stronger links between some professions than others. The quotes

13 suggest that the more 'creative' performers (actors/musicians) may use imagery more for

14 motivational reasons (to calm down or get in the right state), and don't use imagery for

15 cognitive purposes (because everything is so well learned). On the other hand the more

16 'functional' performers (golfers/surgeons) appear to benefit from engaging in more cognitive

17 forms of imagery. This build be because great rehearsal is required because the movements in

18 these domains are so complex.

19 While some participants highlighted that visualization was a technique that they were taught

20 or told about, some participants appeared to have organically developed their ability as a way

21 to cope with the demands of the situation. For example, participant eight (Musician) stated

22 that:

23 My mum visualizes very easily, not through any training or anything like that but

24 naturally she would just do it and not with meditation you know. So I think that I have

1           always done it [visualization], but I don't think I really employed it or understood what  
2           I was doing until later you know I think I went through my 20s much more stressed.  
3 Imagery, and specifically visualization has been highlighted as an important technique applied  
4 in aiding performance in a number of domains including sport (Jackson & Baker, 2001; Short  
5 et al., 2002) surgery (Kosslyn, et al., 1993; Sanders, Sadoski, Bramson, Wiprud, & Walsum,  
6 2004; Sevdalis, Moran, & Arora, 2013); and music (Hoffman, & Hanrahan, 2012). So it is not  
7 surprising that this strategy would also be adopted in the pre-performance period. This also  
8 fits with the guidelines developed by Singer (1988) for preparing to perform. Singer  
9 highlighted five steps with the second explicitly relating to imagining.

10           Another technique/intervention used across all four of the performance domains was  
11 the use of relaxation strategies. One approach adopted was meditation/yoga as highlighted by  
12 participant two (Performing Artist) who stated that:

13           It [performance] is always about the relaxation that you can find at the highest level  
14           when you are really performing. Those external factors going on just fade away. So,  
15           sometimes what I do add into my warm up is some sort of meditation sort of things or  
16           taking that rescue remedy stuff or some sort of lavender stuff that just sort of chills you  
17           out sometimes.

18 Indeed, this focus on relaxation appears to have formed a core aspect of the training for  
19 performers from the performing arts domain. This was highlighted by participant five (Actor)  
20 who reflected that:

21           I used to get so much more nervous. You start speaking faster when you are nervous as  
22           well . . . . most of the training was a lot of yoga, a lot of breathing, a lot of relaxing, and  
23           a lot of kind of focus work which is all really to stop you being nervous I think.

1 Other key relaxation skills related to the use of specific breathing techniques. Indeed, these  
2 were seen as a quick, easy, and ultimately effective step to calm down, relax, focus, and think  
3 clearly. For example participant four (Performing Artist) reflected:

4 A lot of breathing, a lot of making sure you don't breath in the wrong place, they teach  
5 you this at drama school, that you breath throughout your body. You breath from your  
6 diaphragm you breath from your ribs, you breath in your chest and you breathe in your  
7 head and when you get nervous generally it stays in your chest and you go 'I am really  
8 really nervous' and that is the worst thing that can happen because the oxygen is not  
9 going everywhere so in the warm-up the thing that I would do is to make sure that I am  
10 definitely breathing from my center and yeah that nothing is trapped.

11 The importance of "just taking a deep breath" was highlighted as a crucial technique to focus,  
12 refocus, and to clear the mind in surgery. This was articulated by participant fifteen (Surgeon)  
13 who acknowledged that:

14 Taking a deep breath is important. It is something I do before I start, as it helps me be to  
15 calm and focus . . . . I also use it as a quick technique in theatre as it is a good way to  
16 get back on task if distracted or something unexpected happens.

### 17 **Influencing factors**

18 A number of factors were highlighted as impacting upon the quality of preparation for  
19 performance. Some of these factors were also highlighted as being impactful during  
20 performance as well. Factors highlighted by the participants in this study included fatigue,  
21 experience, perfectionist tendencies, the process of aging, and the need to adapt to the  
22 environment and the task during real time.

23 Fatigue was highlighted as a particular factor impacting upon the quality of preparation and  
24 general preparedness for performance. Specific sources of fatigue highlighted included lack of

1 sleep, and physical and mental fatigue resulting from engagement in performance. This is  
2 highlighted by participant fourteen (Athlete) who stated that:

3 I can definitely remember instances because I obviously have started to get a little bit  
4 tired, I failed to pick things up in the environment that I normally would of done. For  
5 instance, like the direction of the wind. I have hit shots sometimes where I have hit a  
6 lovely shot and the thing is twenty-five yards too big, then I have put the club in my bag  
7 and I have just thought ‘I can’t believe you have just done that’ and I have actually  
8 failed in my analysis and decision making process to take into account the direction of  
9 the wind.

10 The impacts of fatigue on performance highlighted in this study are consistent with a number  
11 of studies that have explored the effect of fatigue on cognitive performance (Kellmann, 2010).

12 Five of the participants highlighted the impact that the accumulation of greater  
13 experience had upon their preparation. While they might have been taught a specific approach  
14 this had often been adapted over time to meet their specific performance needs. There was  
15 also a feeling that as they developed a greater understanding of their optimal performance  
16 state they could then seek to prepare in a way that maximized the likelihood they would  
17 achieve this state. For example, participant five (Actor) reflected:

18 I have noticed in terms of preparation, I think this comes with experience, we were  
19 talking about it in the dressing room the other day, the younger actors all warm-up, they  
20 all go out there and do lots of vocal warm-ups, about three years into my career I played  
21 a massive Shakespearian part and I was doing lots of warm-ups, but I realized that  
22 actually the warm-ups were not helping me to relax and I realized that I was better and  
23 more relaxed after a late night with some red wine and a good nights’ sleep and just  
24 coming in and doing it than doing any kind of warm-up with tension.

1 These changes over time, and with the development of enhanced experience, could reflect  
2 models of expertise development where performers move through qualitatively different  
3 stages (Baker, Koz, Kungl, Fraser-Thomas, & Schorer, 2013; Côté, Baker & Abernethy,  
4 2007). Parallels could potentially be drawn with time-constrained decision-making sports  
5 such as tennis and squash where cognitive and perceptual adaptations take place to utilize  
6 more advanced cues and to anticipate more effectively (Mann, Williams, Ward, & Janelle,  
7 2007).

8         There was also a view amongst the participants in the study that while you might  
9 prepare as well as you think you can, there was always the potential for something unexpected  
10 to happen that would knock you out of your stride. When this happened it was acknowledged  
11 that live adaptation was a crucial skill to be able to solve the problem as quickly as possible  
12 and to settle on an effective course of action. This point was highlighted by participant five  
13 (Performing Artist) who stated that:

14         I have a few stories when people sort of mess-up on stage, we all do it, on press night  
15 that happened and someone put a line in where it wasn't supposed to be. Part of your  
16 brain goes, and the whole of your body fizzes just for a second where you have to  
17 completely change what you have been doing. You either have to make something up,  
18 or you have to ignore it and move on or whatever and it is just so live it is nice, I really  
19 like that.

20 This view was also reinforced by participant seventeen (Surgeon):

21         Sometimes things happen that you were not expecting, but you just need to be able to  
22 make unemotional decisions . . . . what is the best action to take to resolve the issue . . . .  
23 you have to forget it is a person and just be cold and detached . . . . you know, what is  
24 the problem and what is the best solution!

25 Similarly, this was also highlighted by participant nine (Musician):

1 A lot of the time no one will say, but you are the picky one that know it should have  
2 been an F sharp and you have played an F natural, and you would know the little things  
3 like you didn't hold that note for long enough, but I think it comes with being a  
4 musician, because you just always want to get better. I have been taught to never stop if  
5 you make a mistake, always keep going, and the audience probably won't know that  
6 you made a mistake, then evaluate afterwards.

7 The ability to adapt during performance to unforeseen issues or changes that arise was  
8 highlighted by Cotterill (2014) as a crucial aspect of decision-making for performance. It has  
9 been suggested that expert performance occurs at the limits of human performance, with the  
10 time constraints having a significant impact upon perception and action (Müller, Abernethy,  
11 & Farrow, 2006). Often when the unexpected occurs the ability to rapidly re-select an  
12 appropriate solution to the presenting problem separates the very best from the rest (Johnson  
13 & Raab, 2003; Payne, Bettman, & Johnson, 1993).

14 The participants in the study also acknowledged that the way they viewed their  
15 performances, and as a result the way they prepared for them, had changed over time.  
16 Particularly as they had advanced in years. For example participant four (Actor) reflected that:

17 I think that it gets slightly worse as you get older. You have more to do so there is more  
18 pressure on you and you feel more responsible for it [the performance] and you  
19 understand it in a slightly different way, I also think you also have the memory of so  
20 many different things, you know so many things that can happen, and there is kind of an  
21 innocence of youth and a sort of bravery that is slightly more cavalier. Also, having said  
22 that, I also think you have things in perspective a little better as you get older you know  
23 as people. My mother is very ill at the moment you know, perspective-wise, it is in a  
24 very different place. I am not going to die out there – hopefully!

25 **Preparation function**

1           While the participants utilized a number of similar techniques and interventions to  
2 prepare themselves to perform the perceived function that these strategies fulfilled was not  
3 uniform across all participants. Indeed, different participants highlighted the importance of  
4 their preparation strategies in enhancing their confidence (self-efficacy beliefs); as a warm-up;  
5 as a way to facilitate good performance by priming their relevant movement patterns; as  
6 having a motivating effect; to get into character; and to oxygenate the brain. For example,  
7 participant one (Actor) reflected:

8           I think a lot of it is experience because what you learn from experience is faith in  
9 yourself, belief in yourself, the right to be there, that you can do it, that you have had  
10 things go wrong and you have learnt from that. I don't know if it is something you can  
11 teach, I know some people have a lot of precocious self-belief don't they? Actors are a  
12 curious mix of that, full of insecurity but also full of confidence and to some extent  
13 narcissism actors are a very strange breed of people.

14 This view was also supported by participant eight (Musician):

15           Yeah, it is like you are warming up your fingers, and when your fingers are going you  
16 are more confident in what you are playing, so you don't have to worry about the notes.  
17 All of these factors have previously been highlighted by domain-specific research in sport  
18 regarding the function of the preparatory period (Beilock & Carr, 2001; Beilock et al., 2002;;  
19 Gould & Udry, 1994; Hazell et al., 2014; Marlow, Bull, Heath, & Shambrook, 1998; Masters  
20 et al., 2008; Mesagno & Mullane-Grant, 2010; Moran, 1996).

21           The view that the preparation is helping you to “get into character” ready for the  
22 performance was also shared across the professions. The most apparent and literal example of  
23 this related to the actors in the study. As part of their preparation they had to get into character  
24 ahead of the performance, to ensure that they took on the personality and behaviors of the  
25 character they were playing.

1 There were, though, examples from other performance domains where this need to get into  
2 character was highlighted. One example of this was participant sixteen (Surgeon):

3 You, know . . . you just have to be more confident and know you can do it. You might  
4 have doubts beforehand, but you have to . . . its like flicking a switch . . . . once you step  
5 inside you have to believe 100% that you will be successful and know what to do!

6 Another important function of the preparation period highlighted by the participants in  
7 the study related to re-emphasizing why they enjoy what they do, and as a result reduce the  
8 perceptions of stress. For example, participant eighteen (Surgeon) reflected that:

9 It is about making a difference in peoples lives . . . . a job well done is great, but  
10 understanding the effect it has on the people involved is amazing. During the operations  
11 it is about being detached but afterwards it is good to appreciate the difference what you  
12 have just done can make.

13 This view was also highlighted by participant two (Actor):

14 I love the audience response . . . I love the sort of grittiness of being in a scene and  
15 firing lines at each other and being moved by that. I love moving people as well sort of  
16 to feel like you are powerful in generating emotion in people through something that  
17 you are doing on stage. It matters to people that you are telling a story that strikes a  
18 cord, there is a lot in there I guess but the buzz, the live element is exciting, it is when it  
19 is most exciting . . . . I suppose you have just got to remind yourself of that when you  
20 get nervous waiting to start.

21 The ability for participants to adopt a positive approach to their perception of the situation and  
22 their involvement in it appears to be an important factor. This is consistent with literature that  
23 focuses on motivated behavior (Schinke & Peterson, 2002). Having a clear motivation for  
24 continued involvement in the performance setting appears to be an important factor for  
25 continued engagement. This is supported by the conclusions drawn by Duclos, Peix, and

1 Lifante (2012) in a study of surgeons that highlighted that optimal performance cannot be  
2 achieved just through the accumulation of experience.

3         The final perception of a function that preparation fulfilled related to the oxygenation  
4 of the brain. There was a view, specifically within the acting participants, that getting oxygen  
5 to the brain was a crucial function of their preparation. There is a good scientific rationale for  
6 why increased oxygenation of the brain could aid cognitive performance (Endo et al., 2013),  
7 specifically relating to brains need for oxygen to perform cognitive tasks. However, it is not  
8 necessarily supported that this is achieved via yawning. With the actors in the study there  
9 appeared to be a widespread belief that yawning to enhance the oxygenation of the brain was  
10 definitely a positive function. This view was highlighted by participant five (Actor):

11         I think that relaxation is the key to acting anyway. Being kind of centered and I think  
12         the older and more experienced you get the more used to being in that state you are and  
13         you don't need to engender it. There is another thing that I noticed yawning before I go  
14         on, and I used to think 'oh no I am tired'. But actually I have read somewhere that is the  
15         brain oxygenating yourself because it knows it is about to go through something  
16         potentially testing.

17 While there is little evidence to support yawning as an oxygenation strategy, there is a link  
18 between brain oxygenation and yawning. For example, Burke (2013) highlighted a lack of  
19 oxygen as a precursor of involuntary yawning.

## 20 **Mindset**

21         There was a strong view amongst the participants in this study that ultimately their  
22 mindset had a big impact upon performance, and as a result getting into their “optimal  
23 mindset” was a key factor when engaging in preparation activities and strategies. In  
24 considering what their optimal mindset for performance was, participant two (Actor) reflected  
25 that:

1       Acting is like . . . you have to care and not care in the right way at the same time, so you  
2       have to care very deeply and concentrate but you also need to not care how you come  
3       across if you mess it up otherwise you have to, that is when you get tense and stiff,  
4       when you are trying to get things right, that stops you relaxing makes you second-guess  
5       yourself and definitely if we had been opening this at the national or something the  
6       occasion would have been more of a test.

7       In surgery, participant seventeen stated that:

8       Ultimately it is about delivering time after time after time. There is no margin for error .  
9       . and if you let yourself you can get paralyzed by the pressure. But it is about knowing  
10      you have the skills, knowing what you need to do and then clearing your mind and just  
11      focusing on the task in hand . . . . one step at a time.

12     There was also a view that being calm under pressure was a key characteristic of a good  
13     performance mindset. This view was encapsulated by participant seven (Musician):

14       When you are in that moment the worst thing to do is to panic, we say in life that  
15       thoughts come to you, essentially it is passive in a funny sort of way if you get locked  
16       either physically or mentally that is when you get brain freeze, if you get soft and  
17       relaxed, and keep breathing crucially then that is the way that you find your way out of  
18       it , I am sure a surgeon would agree with that, it is about being calm.

19     The importance of adopting the right mindset is also supported in the performance  
20     psychology literature. For example Swann, Keegan, Piggott, and Crust (2012) highlighted the  
21     importance of flow states for elite performers under pressure. This is also supported by  
22     Broomhead et al. (2012) who highlighted the impact that a positive mindset can have upon  
23     musical performance.

24     **Technique development**

1           The final main theme related to how the participants in the study had developed their  
2 preparatory practice, techniques, and behaviors. There were very distinct differences across  
3 the performance domains. For example, in sport the development of the preparatory behaviors  
4 and strategies appeared to be very ad-hoc. Often the techniques used were less functional and  
5 more as a result of literature the participants had read that related to their sport. For example,  
6 participant twelve (Athlete) reflected:

7           Yeah, I read a book about four or five years ago by Bob Rotella called putting out of  
8 your mind and basically he does not talk at all about the [golf] swing, doesn't talk about  
9 the mechanics or anything, it is just about psychological pre-shot routines. That is when  
10 my game absolutely turned around, that made such a difference to my routine, and since  
11 then it is like a religion . . . . he is like god! Yeah, I completely trust everything he says.

12           There was also a split amongst the acting participants. For those who had gone  
13 through a structured training programme to develop their skills (such as stage school) they  
14 had been taught specific techniques and strategies as part of their training. For example,  
15 participant four (Performing Artist) stated that "Yeah I was taught them at drama school, I  
16 think I would say that most of them, the training is teaching you not to be nervous and how  
17 nerves get in the way of it"

18           There were also a couple of the older actors who had not been through the same formal  
19 development programme. In the case of these individuals they had just organically developed  
20 their own approaches that worked for them. This was highlighted by participant three (Actor)  
21 who stated:

22           Yes, I was never taught because I started when I was 11. I never went to drama school  
23 so had no-one to help me and I think that all of them [younger actors] have been able to  
24 short cut a lot of those you know, someone might have told me something that might  
25 have helped much earlier on.



1 between different domains. This in turn can help to foster dialogue that will seek to enhance  
2 performance and potentially reduce the time required to achieve the relevant levels of  
3 expertise.

4 While this study presents a depth of information regarding the experience of the  
5 participants it is recognized that a sample of 18 across four different domains is still quite  
6 small. As a result, further related enquiry is encouraged that targets larger numbers of similar  
7 participants. Future research should continue to compare and contrast the experience of  
8 performers across pressured domains to seek to understand the transferable lessons that can be  
9 learnt. While the context may differ many of the psychological challenges remain consistent.  
10 Applied studies that seek to implement development programs based upon the lessons learnt  
11 from other performance domains should be prioritized.

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