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What is Clutch Performance? An Examination of Definitional and Conceptual Issues

Matthew J. Schweickle

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What is Clutch Performance? An Examination of Definitional and Conceptual Issues

Matthew J. Schweickle

Supervisors:

Dr. Stewart A. Vella, A/Prof Christian Swann, Dr. Gregory Peoples

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Doctor of Philosophy

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Abstract

Clutch performance refers to successful or improved performance under pressure. Despite a long history of colloquial use and a growing research interest, there remains conflicting definitions and conceptualisations of this construct. Such conceptual divergence has appeared to limit progress towards the development of measurement, theory, and applied interventions for clutch performance. As such, the overarching aim of this thesis was to examine the conceptual foundations of clutch performance, with a specific focus on how current definitions and conceptualisations reflect athletes' perceptions of performing well under pressure.

Chapter 1 provided a foundation for the research program. Specifically, prominent definitions and conceptualisations of clutch performance were identified, key constructs defined, and theoretical models reviewed. Further, the approach taken to conceptual refinement within this thesis was outlined. Chapter 2 (Study 1) aimed to systematically review the existing body of literature on clutch performance in sport and exercise. A narrative synthesis of 27 published studies indicated that there was considerable definitional, conceptual, and measurement heterogeneity in the field of clutch performance. Recommendations arising from this synthesis indicated that to resolve this heterogeneity, athletes' perceptions of performing well under pressure should be considered in shaping definitions of clutch performance. Accordingly, Chapters 3, 4, and 5 consisted of studies aimed at contributing to a refined, athlete-centred definition of clutch performance.

Chapter 3 (Study 2) consisted of a qualitative study aimed at examining athletes' perceptions of clutch situations, and further, how these perceptions influenced their performance. Participants involved 16 athletes who partook in event-focused interviews. Athletes reported that the appraisal of clutch situations is influenced by both situational

and subjective factors. Further, these appraisals fluctuated throughout sporting events, suggesting that there may be multiple, fluctuating episodes of the clutch. This appraisal of pressure, meanwhile, was reported to influence performance, yet performance was also reported to influence the appraisal of pressure. Lastly, it was found that the experience of anxiety may not be inherent to clutch performances. Chapter 3 concluded that the clutch should be considered as an appraisal of increased pressure. Accordingly, clutch performances may occur during any period of increased pressure appraisal, and not only during specific situational circumstances.

Chapter 4 (Study 3) comprised of a mixed methods multiple case study which aimed at examining whether clutch performances should be assessed using objective performance indicators (e.g., performance statistics) or subjective performance indicators (e.g., perceived performance). Six unique case studies were drawn from four semi-elite basketballers. Results suggested that whilst objective indicators were important for identifying clutch performance, these indicators were often viewed through a subjective lens. Subjective indicators such as perceived control and effort, meanwhile, were also important in identifying clutch performance. Chapter 4 concluded that operationalisations of clutch performance should also consider athletes' subjective interpretations of performance, and not solely rely on objective indicators.

Chapter 5 (Study 4) consisted of a qualitative study aimed at exploring athletes' perceptions of the performance level required (i.e., does performance need to increase, or be maintained) for clutch performance, and further, what benchmarks such performances are compared against. Participants involved 24 athletes' who participated in event-focused interviews. The results indicated that clutch performances are primarily assessed against the extent to which an athlete achieves their self-referenced goals. As such, athletes reported that the performance level required for clutch

performance differed depending on both their goals and their appraisal of pressure. Lastly, whilst some athletes reported using previous performances as a benchmark to compare clutch performance against, others assessed clutch performance based only on the performance itself. Chapter 5 concluded that clutch performance may be conceptualised as the extent to which self-referenced goals are achieved under an appraisal of increased pressure.

Chapter 6 provided a discussion of the program of research. Specifically, this Chapter outlined the underlying principles of a refined definition and conceptualisation of clutch performance and considered the implications of such an approach to theory and measurement. This Chapter also provided reflections on the strengths and limitations of the thesis, and directions for future research. Overall, the findings of this thesis may be of interest to researchers and applied practitioners working in the field of performance under pressure.

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Certification

I, Matthew James Schweickle, declare that this thesis submitted in fulfilment of the requirements for the conferral of the degree Doctor of Philosophy, from the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

Matthew James Schweickle

Date: 21/08/2021

Thesis Style

This thesis has been prepared in journal article compilation style format. A signed thesis style format agreement between the PhD candidate and primary supervisor can be found in Appendix A.

Publications from this Thesis

Chapter 2

Schweickle, M. J., Swann, C., Jackman, P. C., Vella, S. A. (2020). Clutch performance in sport and exercise: a systematic review. *International Review of Sport and Exercise Psychology*, 1–28. <https://doi.org/10.1080/1750984X.2020.1771747>

Chapter 3

Schweickle, M. J., Vella, S. A., & Swann, C. (2021). Exploring the “clutch” in clutch performance: A qualitative investigation of the experience of pressure in successful performance. *Psychology of Sport and Exercise*, 54, 101889. <https://doi.org/10.1016/j.psychsport.2021.101889>

Chapter 4

Schweickle, M. J., Swann, C., & Vella, S. A. (under review – revise and resubmit). Objective and subjective performance indicators of clutch performance in basketball: A mixed methods multiple case study. Submitted to *Journal of Applied Sport Psychology*.

Chapter 5

Schweickle, M. J., Vella, S. A., & Swann, C. (under review – revise and resubmit). Was it a clutch performance? A qualitative examination of the definitional boundaries of clutch performance. Submitted to *Psychology of Sport and Exercise*.

Components of this thesis have also been presented at:

1. The British Psychological Society Division of Sport and Exercise Psychology Conference, 2019, Solihull, UK.
 - i. Schweickle, M. J., Swann, C., Jackman, P. C., & Vella, S. A. (2019, December). *Clutch Performance: A Systematic Review*. Paper presented at the British Psychological Society, Division of Sport and Exercise Psychology Conference, Solihull, UK.
2. The TEMPER conference on Training Enhancement and Military PERFORMANCE, 2020, Canberra, Australia.
 - i. Schweickle, M. J., Goddard., S. Swann, C., Jackman, P. C., Stevens, C. J., & Vella, S. A. (2020, February). Systematic reviews of optimal psychological states: Insights into Flow and Clutch performance. Paper co-presented at the first TEMPER workshop on Training Enhancement and Military PERFORMANCE, Canberra, Australia.

In all cases of work that has been published, presented and admitted for publication, the greater part of the work is directly attributed to me, as a PhD candidate. Supervisors have enacted their role in the formulation of research ideas and in editing manuscripts. All investigations, analyses and reporting have been carried out solely by me, in keeping with the requirements of my candidature. A signed statement of contribution can be found in Appendix B.

List of Names or Abbreviations

AST:	Assists
CSAI-2R:	Competitive State Anxiety Inventory-2 (Revised)
FG%:	Field goal percentage
FGA:	Field goals attempted
FIFA:	Federation Internationale de Football Association
FT%:	Free throw percentage
IAMS:	Immediate Anxiety Measures Scale
MLB:	Major League Baseball
NBA:	National Basketball Association
NRL:	National Rugby League
PRISMA:	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PTS:	Points

List of Definitions

- Appraisal: “A person’s cognitive evaluation of the meaning and significance of a perceived demand” (Fletcher et al., 2006, p. 13).
- Choking: “An acute and considerable decrease in skill execution and performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure” (Mesagno & Hill, 2013a, p. 273).
- Competitive Anxiety: “A specific negative emotional response to competitive stressors” (Mellalieu et al., 2006, p. 3).
- Coping: “A constantly changing cognitive and behavioral effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141).
- Emergent Goal: “The goal arises out of a unique interaction between person and environment” (Csikszentmihalyi, 2015, p. 208).
- Event-Focused Interview: “The event-focused interview method involves interviewing participants in relation to an episode of a target phenomenon (i.e., the ‘event’) soon after it has occurred” (Jackman et al., 2021, p. 2).
- Exercise: “A subcategory of physical activity that is planned, structured, repetitive, and purposive, in the sense that

the improvement or maintenance of one or more components of physical fitness is the objective” (WHO, 2018, p. 98).

Flow: “An intrinsically rewarding, harmonious psychological state involving intense focus and absorption in a specific activity, with a sense of everything coming together or clicking into place, even in challenging situations” (Swann et al., 2018, p. 1).

Outcome Goal: “Outcome goals are based on the outcome of a specified event and may involve interpersonal comparison of some kind (e.g., a finishing place in a race or winning and losing)” (Kingston & Wilson, 2009, p. 83).

Perceived Control: “One’s perceptions of their capacity to be able to cope and attain goals under stress” (Cheng et al., 2009, p. 273).

Performance: “An individual is performing whenever he or she carries out a task in a situation that calls for an optimal outcome. Performance situations imply a goal of immediate, maximal achievement” (Baumeister & Showers, 1986, p. 362).

Performance Goal: “Performance goals are self-referenced, and refer to a specific end product of performance; they normally involve a numeric value (Duda, 2001), and can be achieved by the performer relatively independently of others (e.g., the total number of putts taken in the

duration of a round of golf)” (Kingston & Wilson, 2009, p. 83).

Pressure: A distinct psychological episode within a performance, during which the performer is both aware of, and motivated to achieve, the incentives for maximal, optimal, or superior performance (Baumeister, 1984; Baumeister & Showers, 1986).

Process Goal: “Process goals centre on the execution of behaviours, skills and strategies (e.g., technique, form, thought processes to regulate behaviour) that are integral to effective task execution” (Kingston & Wilson, 2009, p. 83).

Sport: “An activity involving physical exertion, skill and/or hand-eye coordination as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organizations; and may be participated in either individually or as a team” (WHO, 2018, p. 101).

Stress: “An ongoing process that involves individuals transacting with their environments, making appraisals of the situations they find themselves in, and endeavouring to cope with any issues that may arise” (Fletcher et al., 2006, p. 9).

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Chapter 1: Background Literature and Aims

1.1 Introduction

Facilitating athletes' performance under pressure is a fundamental aim of sport psychology (e.g., Harmison, 2011). The occurrence of important moments and the experience of pressure are inherent features of sport (Jordet, 2009; Pensgaard & Roberts, 2000), and accordingly, the ability to perform under pressure is a crucial aspect of sporting performance (e.g., Mesagno & Mullane-Grant, 2010). Certain athletes and teams have cultivated reputations for their perceived ability to consistently perform under pressure, such as Michael Jordan (Wallace et al., 2013), Roger Federer (Higgins, 2018), and the New Zealand All Blacks (Hodge & Smith, 2014). Not only is performing under pressure important for sporting performance, but it can also carry large financial incentives for athletes. For example, teams within the National Basketball Association (NBA) provide higher salaries to athletes who are perceived to perform better under pressure (Sigler, 2020). Furthermore, positive performance under pressure may contribute to more enjoyable and rewarding experiences in sport (Nicholls et al., 2010; Otten, 2013). For example, after scoring the winning goal in the 2014 FIFA World Cup Final, German forward Mario Götze described that "it will probably be the experience I cherish most" (The World Game, 2019). In contrast, and following an underperformance in the same final, Argentinean forward Gonzalo Higuaín considered retiring from football (Edwards, 2019).

Whilst elite athletes provide the most visible examples of performing under pressure, the ability to do so is of importance across a range of contexts. Indeed, to even make it to an elite level, sub-elite athletes will need to overcome pressure situations (Kent et al., 2021), whilst the experience of pressure has been reported in performance-related domains such as: exercise (Swann et al., 2019); adventure sports (Houge

Mackenzie et al., 2011); e-sports (Pedraza-Ramirez et al., 2020); policing (Nieuwenhuys & Oudejans, 2011); and education (Rosenthal & Crisp, 2007).

Understanding how to facilitate performance under pressure, therefore, is fundamental for practitioners working within performance-related domains.

Clutch performance refers to improved or successful performance under pressure (Hibbs, 2010; Otten, 2009). Given the importance of performing well under pressure, understanding clutch performance is of interest to both sport psychology practitioners and the broader sporting community. Research in this field, however, has typically focused on the negative effects of pressure on performance. Specifically, this focus has been on the concept of choking, defined as “an acute and considerable decrease in skill execution and performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure” (Mesagno & Hill, 2013a, p. 273). Otten (2013) summarised that:

the problem is, the choking literature in sport psychology is many years more advanced than that of clutch performance, something that is perplexing given the proliferation of examples of clutch play that popular media so often put forth these days (p. 285).

As such, the research landscape in the field of performance under pressure has been characterised by a focus on choking under pressure (Gröpel & Mesagno, 2019; Hill et al., 2010a), with less attention paid to the potential of performing well under pressure, despite the appeal of clutch performances to athletes, coaches, and practitioners.

Underlying the construct of clutch performance are several definitional and conceptual issues that have inhibited the development of applied strategies and interventions to facilitate clutch performance. Specifically, there appears a lack of consensus over how best to define and operationalise clutch performance, with

Mesagno and Hill (2013a) noting that: “We would caution researchers investigating ambiguously defined factors of performance under pressure (e.g., clutch performance, perceived control) to create clear operational definitions to ensure clarity of the research paradigm” (p. 275). Definitions play an important role in determining the nature and direction of research (Cooper et al., 2001). At present, however, the lack of definitional clarity surrounding clutch performance appears to have resulted in a field comprised of conflicting evidence over whether this construct even exists (e.g., Newman, 2013), contrasting approaches to measurement (e.g., using objective performance outcomes or subjective recall; Hill et al., 2017; Otten & Barret, 2013), and inconsistent theoretical explanations of how clutch performances may occur (e.g., in response to anxiety or as an optimal psychological state; Gray et al., 2013; Swann et al., 2017a). In response to calls to advance the literature on, and develop a robust operational definition of, clutch performance (Mesagno & Hill, 2013a; Otten, 2013), the overarching aim of this thesis was to examine the conceptual foundations of clutch performance. Specifically, these foundations were examined from the perspective of athletes’ experiences and perceptions of performing well under pressure. Understanding athlete perspectives is important as successful definitions should reflect the views of those affected by said definition (Laas, 2017). Accordingly, this thesis had the following sub-aims:

- 1) Systematically collate, synthesise, and review the current research on clutch performance in sport and exercise, and identify the key areas requiring investigation;
- 2) Explore when, and under what conditions, clutch performances may occur;
- 3) Understand if clutch performance should be assessed as an objective, or subjective, performance phenomenon;
- 4) Examine the performance level required for clutch performance; and,

5) Provide a refined understanding of what clutch performance is, and how it may be defined to reflect athletes' views.

In exploring these sub-aims, I ultimately sought to provide an athlete-centred understanding of what clutch performance is, and subsequently, how it should be defined and conceptualised.

1.2 Defining and Conceptualising Clutch Performance

The first recorded use of the term clutch occurred in a 1929 New York Times article on baseball, which reported that “when a batter provides a safe ‘blow’ in an opportune moment, his fellow players say that he has hit ‘in the saddle’ or ‘in the clutch’” (Safire, 2005). In this sense, the term clutch was first used to represent a specific, important moment in the sport of baseball. Despite this term originating nearly a century ago, however, the definitions of clutch performance which are most widely used within the empirical literature have only emerged more recently. Specifically, the two most prominent definitions of clutch performance are those provided by Otten (2009) and Hibbs (2010).

Otten (2009) defined clutch performance as “any performance increment or superior performance that occurs under pressure circumstances” (p. 584). Initially, Otten (2009) provided this definition to “balance Baumeister’s (1984) definition of choking under pressure” (p. 584), highlighting that “for every example of an athlete choking in modern sports, there seems to be many more examples of *clutch* performers” (p. 583, italics in original). Indeed, this definition was underpinned by a broader, positive psychology approach to performance under pressure (e.g., Otten, 2013). The two primary components of Otten’s (2009) definition are therefore that: (1) the performance occurs under pressure; and (2) an athlete increases their performance level.

Hibbs (2010), meanwhile, defined clutch performance as:

when a participant in competitive sport succeeds at a competitive-related, challenging task during a clutch situation, is aware that the performance occurs during a clutch situation, possesses the capacity to experience clutch situation-related stress, cares about the outcome of the contest, and succeeds primarily due to skill rather than luck or cheating (p. 55).

Within this definition, Hibbs (2010) also introduced the concept of a clutch situation, defined as “a point in a competitive sport where the success or failure of the participants has a significant impact on the outcome of the contest” (p. 48). The conditions underlying Hibbs’ (2010) definition of clutch performance are therefore that: (1) the performance has a significant impact on the outcome of the contest; and (2) the performance is successful. Whilst at face value these two definitions appear similar, and have previously been used together when defining clutch performance (e.g., Swann et al., 2017a), there are meaningful differences that have implications for our understanding of both when clutch performances may occur, and further, the performance level required for clutch performance. In turn, these differences have affected how clutch performance is both measured and theorised, and further, conclusions surrounding whether the construct of clutch performance even exists as an observable phenomenon in sport.

1.2.1 Issues in Defining Clutch Performance

1.2.1.1 When Do Clutch Performances Occur?

The definitions provided by Otten (2009) and Hibbs (2010) differ on when clutch performances can occur. Both Otten (2009) and Hibbs (2010) recognise that pressure is inherent to clutch performances. How such pressure is conceptualised in each definition, however, contrasts. Otten (2009) appeared to suggest that clutch performances may occur under any pressure circumstances, drawing on Baumeister's

(1984) widely-used conceptualisation of pressure in sport (see section *1.3.1 What is Pressure?* below). In contrast, Hibbs (2010) delineated that clutch performances only occur during situations that have a significant impact on the outcome of the contest, specifying that “to credit a player with a clutch performance is to credit a player with meeting a challenge that includes the potential psychological pressure of the situation... clutch situations are so because of the psychological challenge presented by the circumstances” (p. 51-52). As such, whilst Hibbs (2010) recognises that there is a psychological component to clutch performances (i.e., pressure), it remains a condition that clutch performances only occur during situations that significantly impact the outcome of the contest (e.g., a match-winning field goal), seemingly overlooking the subjective nature of the experience of pressure, stress, and anxiety (see section *1.3 Conceptual Clarity: Pressure, Anxiety, and Stress* below). Furthermore, given the dynamic nature of sports, determining the specific situations which had a significant impact on the outcome of the contest may be ambiguous, as Hibbs (2010) notes: “in some cases the boundary between clutch and nonclutch situations is fuzzy” (p. 49). Based on current definitions of clutch performance, therefore, it is unclear under what situations or circumstances this phenomenon should be investigated, resulting in disparate approaches to measuring clutch performance.

1.2.1.2 What Performance Level is Required for Clutch Performance?

The definitions provided by Otten (2009) and Hibbs (2010) also diverge on the performance level required to constitute clutch performance. Balancing the definition of choking (i.e., a decrement in performance; Baumeister, 1984), Otten (2009) specified clutch performance as “any increment or superior performance” (p. 584). Otten’s (2009) definition, therefore, requires that athletes raise their performance level to be considered a clutch performance. It is unclear, however, what such an improvement would be

compared against (e.g., season average, career average, teammates) or how it would be assessed (i.e., is an increase in effort sufficient, or must it be an increase in skilled performance?). Hibbs (2010), meanwhile, specified that clutch performances involve succeeding at a challenging task, which only requires an athlete to perform in accordance with their ability, despite the pressure of the circumstances. Hibbs (2010), therefore, calls for maintenance of an athlete's performance level, whereas Otten (2009) calls for an increase in their performance level to be classified as a clutch performance. As such, current definitions of clutch performance conflict over what performances may even be considered to fall under this construct.

1.2.2 Issues in Conceptualising Clutch Performance

1.2.2.1 How Should Clutch Performance be Assessed?

Simply put, there is confusion over what the construct of clutch performance is. Specifically, clutch has been conceptualised and measured as: an outcome (e.g., match winning percentage; Jetter & Walker, 2015); an observable behaviour (i.e., successful basketball free-throws; Worthy et al., 2009); a trait or ability (i.e., consistent performance in pressure situations over multiple performances or seasons; Birnbaum, 2008); and a psychological state (i.e., the subjective experience of clutch performance; Swann et al., 2017a). Given these varying conceptualisations, and a lack of clarity over when clutch performances can occur, it is unclear how one should assess clutch performance. For example, assessments of clutch performance have ranged from using performance statistics in pre-identified pressure situations (e.g., Otten & Barrett, 2013) to using athletes' recall of their own performances under pressure (e.g., Hill et al., 2017). Depending on how one conceptualises clutch performance, therefore, this construct has been used to reflect anything from an observable, objective behaviour to a subjective, psychological state. In turn, this lack of conceptual clarity has resulted in

conflicting evidence over the extent to which clutch performance exists as a construct within sport, and further, how such performances may occur.

1.2.2.2 Is Clutch Performance the Opposite of Choking Under Pressure?

Questions remain over whether clutch performance is a unique phenomenon with distinct mechanisms or, conceptually, represents the opposite of choking under pressure. Typically, clutch performance has been measured in opposition to choking, which is a distinct, and drastic, performance decrement in response to anxiety (Mesagno & Hill, 2013a). For example, in an interview-based qualitative study, Hill et al. (2017) compared “the choking experience with its opposite case (i.e., the clutch)” (p. 143). Similarly, experimental designs often compare clutch performances to choking responses (e.g., Gray et al., 2013), whilst archival studies have also investigated these phenomena as opposites (e.g., Cao et al., 2011). Some researchers, meanwhile, have appeared to use the concept of clutch performance interchangeably with that of choking-resistance (e.g., Mesagno & Marchant, 2013). Whilst these concepts do sit at opposing ends of a performance spectrum (i.e., clutch performance broadly refers to positive performance, whilst choking refers to negative performance), there remains an important distinction between behavioural changes (i.e., performance), and the mechanisms which may underlie these changes. For example, Otten (2013) noted that “clutch performance and the avoidance of choking are thus likely distinct in psychological origin” (p. 287). Similarly, in conceptualising choking, Mesagno and Hill (2013a) argued that choking is separate from underperformance: “choking is a distinctive sporting failure that differs from other performance failures both qualitatively and quantitatively” (p. 272). Accordingly, whilst clutch performance and choking both are conceptualised to exist on a shared spectrum of performing under

pressure, it is unclear if the mechanisms underlying these phenomena, and by extension, their theoretical explanations, are the same.

1.2.3 Implications of Definitional and Conceptual Issues

It is difficult to provide clarity on a phenomenon until an agreed upon definition has been established (Hill et al., 2010a). At present, there is conflicting evidence as to whether clutch performance exists as an observable phenomenon in sport. For example, Wallace et al. (2013) found no evidence for clutch performers in the NBA, noting that “most players are, in a statistical sense, simply average in that their in-game performances do not rise or elevate as these playoff games enter the so-called ‘clutch time’ portion” (p. 647). In contrast, Jetter and Walker (2015) reported higher-ranked tennis players were more likely to win matches, and were also more likely to win decisive sets, during Grand Slam tournaments when compared to less important tournaments. This finding was taken by Jetter and Walker (2015) to suggest that higher ranked players have an ability to produce clutch performances when the stakes were highest (i.e., Grand Slam tournaments). Different approaches, however, to defining and conceptualising clutch performance were adopted in these studies. Specifically, whilst both studies conceptualised clutch performance as a trait or ability, Wallace et al. (2013) assessed this by using individual performance behaviour (e.g., field-goal percentage), whilst Jetter and Walker (2015) drew on outcome-related criteria (e.g., winning the match). Indeed, Wallace et al. (2013) did not provide a definition for clutch performance, whilst Jetter and Walker (2015) provided the broad definition of “the clutch-player effect argues performance increases when stakes are higher” (p. 97).

These studies provide an example of the implications of heterogeneous approaches to defining and conceptualising clutch performance, in this case resulting in contrasting evidence on the fundamental question of whether clutch performance even

exists. As will be discussed in detail below (section *1.4 Theoretical Models of Performance Under Pressure*), this conceptual divergence also appears to have resulted in inconsistent theoretical approaches to explaining clutch performance. There appears a need, therefore, to critically examine current definitions and conceptualisations of clutch performance in an effort to provide clarity over what this construct is.

1.3 Conceptual Clarity: Pressure, Anxiety, and Stress

Pressure is a fundamental component of clutch performance. In the sport psychology literature, however, the constructs of pressure, stress, and anxiety have been applied inconsistently (Mellalieu et al., 2006), and indeed, are often used interchangeably (Kent et al., 2018). For example, in a recent meta-analysis of the effectiveness of pressure training for performance domains, Low et al. (2020) included search terms such as “pressure training”, “anxiety training”, and “stress training” (p. 3). The interchangeable use of these concepts is also evident in research examining clutch performance. For example, Gray et al. (2013) utilised a psychometric measure of anxiety to measure pressure in an experimental, golf-putting task. In contrast, Hill and Hemmings (2015) explored the sources of stress in their qualitative investigation of athletes’ clutch performances and choking episodes. Indeed, Otten (2013) noted “researchers have often fallen into the trap of terming our line of study ‘choking research’ and terming an athlete’s response ‘anxiety’ or ‘stress’” (p. 287). Whilst there is overlap between these constructs (e.g., Gucciardi & Dimmock, 2008), failing to specify conceptual boundaries can result in broad and disparate measurement of a construct (Spiker & Hammer, 2019; Wacker, 2004), which ultimately, may have implications for our ability to understand the processes underlying clutch performance. Given the definitional and conceptual issues that underlie clutch performance, it is therefore essential that clarity is provided surrounding related constructs, as to not

further add to this confusion. As such, this section provides the definitions and underlying conceptualisations of pressure, anxiety, and stress to be utilised throughout this thesis, and further, a discussion of how these constructs differ and overlap.

1.3.1 What is Pressure?

Current understandings of the concept of pressure in sport arose from the work of Baumeister (1984) and Baumeister and Showers (1986), who investigated choking during sport and mental tests. Specifically, Baumeister (1984) defined pressure as “any factor or combination of factors which increases the importance of performing well on a particular occasion” (p. 610), whilst Baumeister and Showers (1986) defined pressure as “the presence of situational incentives for optimal, maximal, or superior performance” (p. 362). Baumeister and Showers (1986) specified common situational incentives which may increase pressure, such as: the contingency of rewards or punishment based on the performance; the presence of an audience or competitors; the relevance of the performance to the performer’s ego; and the likelihood that one will not receive a second chance. The notion that specific situational factors create pressure is the foundation for archival studies examining clutch performance (e.g., Cao et al., 2011), as well as underlying experimental manipulations (e.g., introducing monetary rewards, competition, and peer evaluation; Gray et al., 2013; Gray & Cañal-Bruland, 2015). As such, the concept of pressure has been defined, and is often considered, in relation to the presence of specific situational variables.

Often overlooked in operationalisations of pressure is that pressure is an inherently psychological phenomenon. Whilst Baumeister and Showers (1986) identified common sources of pressure, they also recognised that pressure is innately subjective. This subjectivity exists at two levels: (1) the performer must be aware of the incentives for optimal performance; and, (2) the performer must be motivated to

perform well in response to these incentives (Baumeister & Showers, 1986). Further, Baumeister (1984) highlighted that pressure may be experienced in non-competitive environments, despite such environments seemingly lacking a number of the common situational sources of pressure (e.g., competition, rewards). The aforementioned incentives may therefore not only relate to external incentives, but also internal motivations and goals. As Baumeister (1984) notes: “The fact that subjects could avoid the effects of pressure by internally abandoning the goal also implies that the situation alone does not create pressure” (p. 617). Pressure, therefore, represents a psychological phenomenon based on subjective appraisal, and as such, it may be the case that different performers, within the same environmental conditions, do not experience a uniform appraisal of pressure.

In addition to being a psychological phenomenon, pressure is also episodic in nature, with a focus on the present performance. Baumeister and Showers (1986) specified that “pressure by definition focuses on a single, present performance” (p. 362). For example, Baumeister and Showers (1986) noted that “to say that a team ‘choked’ in a championship series of games is to say that pressure interfered with their performance on many single occasions and moments during that series” (p. 362). Further, the appraisal of pressure stems from the performer striving for optimal performance, rather than the preservation or improvement of their own well-being (Baumeister, 1984; Kent et al., 2018). Pressure in sport, therefore, may be characterised as a distinct psychological episode within a performance, during which the performer is both aware of, and motivated to achieve, the incentives for maximal, optimal, or superior performance.

1.3.2 What is Anxiety?

Competitive anxiety has been defined as “a specific negative emotional response to competitive stressors” (Mellalieu et al., 2006, p. 3). Traditionally, anxiety has been recognised as having both a somatic component, that is, the physiological-affective elements of the anxiety experience, and a cognitive component, referring to the cognitive elements of anxiety such as negative expectations or concerns (Morris et al., 1981). More recently, a regulatory component has been suggested as the third dimension of anxiety (Cheng et al., 2009; Jones et al., 2019). Broadly, this component is represented by the concept of perceived control (Cheng et al., 2009), and stems from the notion that anxiety can, in some instances, be facilitative towards performance (Cheng et al., 2009; Mellalieu et al., 2006). As such, whilst anxiety is a negatively toned emotion, it may not always be detrimental to performance.

The notion that anxiety can be facilitative towards performance has been a point of debate amongst researchers working within this field (e.g., Mellalieu & Lane, 2009). Specifically, whilst common approaches to measuring anxiety, such as the Competitive State Anxiety Inventory-2 (Revised) (CSAI-2R; Cox et al., 2003), consider directionality (i.e., whether athletes interpret anxiety symptoms as facilitative or debilitating), as well as symptom intensity, concerns have been raised over the construct validity of facilitative anxiety. For example, Polman and Borkoles (2011) stated that “anxiety by definition is a negatively toned and unpleasant emotion that cannot be facilitative” (p. 303). In providing this critique, Polman and Borkoles (2011) drew on research that suggests different areas of the brain are activated by positive and negative emotions (e.g., Panskepp, 2008). Hence, the notion that emotions are interpreted as facilitative or debilitating after experiencing them was argued to lack support at a neurological level (Polman & Borkoles, 2011). Indeed, the proposition of a regulatory

component of anxiety moves away from focusing on symptom interpretation, and towards how one appraises that they can cope with perceived threats (Cheng et al., 2009; Jones et al., 2019). In contrast to these critiques, Hanton et al. (2008) noted that there is “an abundance of evidence that suggests that although anxiety is a negative emotion, it may be interpreted as facilitative towards performance and promotes effective behaviour during competition” (p. 50). In sum, whilst debate exists over the extent to which anxiety may be interpreted in a facilitative manner, there is a shared acknowledgement that foundationally, anxiety is a negative emotion.

The concepts of pressure and anxiety are widely confounded in the sports psychology literature. Commonly, it is assumed that an increase in situational sources of pressure (i.e., presence of audience or competition, reward or punishment contingency, likelihood of receiving a second chance) leads to an increase in anxiety (e.g., Gucciardi & Dimmock, 2008). For example, when assessing the effectiveness of pressure manipulations, experimental studies rely on psychometric measures of anxiety as a means of determining if pressure has increased (e.g., Gray & Cañal-Bruland, 2015). Whilst it may be the case that pressure can lead to increased anxiety, there is limited evidence to suggest that this is always the case. As Eysenck and Wilson (2016) note: “the association between pressure and anxiety is often smaller than assumed... the most important reason competitive pressure does not always lead to enhanced anxiety is because there are large individual differences in how such pressure is interpreted” (p. 331-332). Indeed, such individual differences may explain why experimental pressure manipulations do not always result in increased anxiety (e.g., Mesagno et al., 2011). From a conceptual perspective, meanwhile, pressure and anxiety are distinct. Specifically, pressure is defined by an awareness of, and motivation to achieve, incentives to perform well. Accordingly, the concept of pressure does not implicate any

emotional response. In contrast, anxiety is a specific negative emotional response, which whilst may be interpreted facilitatively or appropriately regulated, is still contingent on this initial negative emotional response. In sum, measurement and theoretical explanations of clutch performance should be assessed, and developed, with the recognition that pressure and anxiety are distinct concepts.

1.3.3 What is Stress?

Stemming from the work of Lazarus (1981), Fletcher et al. (2006) defined stress as “an ongoing process that involves individuals transacting with their environments, making appraisals of the situations they find themselves in, and endeavouring to cope with any issues that may arise” (p. 9). Underlying this definition is a recognition that during stressful encounters, the athlete and the environment mutually affect one another (Lazarus, 1981; Lazarus & Launier, 1978). Specifically, this definition moves away from conceptualising stress as either a stimulus or a response, and rather focuses on the relational meaning that an athlete appraises from their relationship with the environment (Fletcher et al., 2006). When there is a misalignment between stressors, which are the “environmental demands (i.e., stimuli) encountered by an individual” (Fletcher et al., 2006, p. 9), and the athlete’s perceived ability to cope, strain may occur. Strain is defined as “an individual’s negative psychological, physical, and behavioural responses to stressors” (Fletcher et al., 2006, p. 9). Anxiety is one example of such a negative response (Mellalieu et al., 2006). Mirroring conceptualisations of pressure and anxiety, therefore, the role of individual, subjective appraisals also underlie the concept of stress.

Conceptually, stress differs from both pressure and anxiety in several ways. First, whilst stress may occur in relation to performance, the stress process is also focused on the preservation and maintenance of an individual’s well-being (Kent et al., 2018; Lazarus & Folkman, 1984). In contrast, pressure is focused on the desire to

perform optimally, rather than the preservation of well-being (Baumeister, 1984; Baumeister & Showers, 1986). Secondly, stress appears to represent a broader, ongoing process than pressure or anxiety. For example, in the meta-model of stress, emotion and coping provided by Fletcher et al. (2006), there is a recognition that the stress process involves multiple appraisals and emotional responses, which subsequently feed back into the future appraisal of stressors. Indeed, anxiety represents just one emotional response that may be experienced within this broader process (Fletcher et al., 2006; Mellalieu et al., 2006). Whilst pressure may also be related to the experience of different emotions and coping responses, at present, conceptualisations of pressure centre on the awareness, and appraisal, of external or internal incentives to perform well (Baumeister, 1984; Baumeister & Showers, 1986).

1.4 Theoretical Models of Performance Under Pressure

Two main theoretical approaches have been adopted to explain clutch performance. Specifically, these approaches involve: (1) drawing on anxiety-performance theories typically employed to explain choking under pressure; or (2) focusing on the psychological state underlying clutch performance. Both approaches, and their potential limitations in explaining clutch performance, are described below.

1.4.1 Anxiety-Performance Theories

The most common theoretical explanations of clutch performance adopted within the literature draw on anxiety-performance theories. Typically, such theories are focused on explaining the mechanisms underlying choking under pressure. Given clutch performance is often positioned on the same conceptual spectrum, however, these theories have also been used as the theoretical basis in studies examining clutch performance (e.g., McEwan et al., 2012). The three models primarily used in the clutch performance literature are explained below.

1.4.1.1 Attentional Theories

An important component of optimal performance is focusing one's attention on relevant information and processes, whilst simultaneously ignoring irrelevant cues (Mesagno & Beckmann, 2017). Attentional theories of performance under pressure posit that in response to increased anxiety, an athlete's attention is diverted to either internal, or external, irrelevant cues, which can result in choking (Beilock & Carr, 2001). The two broad categorisations of attentional theories are self-focus, and distraction, theories.

1.4.1.1.1 Self-Focus Theories. The well-known concept of 'paralysis by analysis' captures the core tenet of self-focus, and includes theories such as conscious control theory (Baumeister, 1984), the explicit monitoring hypothesis (Beilock & Carr, 2001), and reinvestment theory (Masters, 1992). Broadly, these theories all centre on the notion that, in response to increased anxiety, athletes' attempt to increase their effort, but in doing so, shift their attention towards internal processes (e.g., skill execution). As a result, athletes' attempt to consciously monitor or control their skill execution, resulting in a step-by-step procedural performance in place of the otherwise automatic execution of skills, leading to decreased performance (Gröpel & Mesagno, 2019). Essentially, this process reflects an experienced athlete reverting to how novices would learn a skill (i.e., procedural based; Hill et al., 2010a). It is unclear, however, how performance may increase in response to pressure under self-focus theories.

1.4.1.1.2 Distraction Theories. Explanations based on distraction theories posit that in response to increased cognitive anxiety, attention is diverted towards task-irrelevant cues. The primary theories of distraction are processing efficiency theory (Eysenck & Calvo, 1992), and its successor, attentional control theory (Eysenck et al., 2007). Broadly, these theories hold that cognitive anxiety reduces the processing

capacity of working memory, which results in a reduction in processing efficiency (i.e., how efficiently resources are used to achieve a performance level). This reduction in processing efficiency, however, can be compensated for by increased effort and the utilisation of additional processing resources (Eysenck & Wilson, 2016). Thus, whilst distraction can result in decreased performance, this can be protected against by increasing mental effort, allowing for the possibility of increased performance in response to anxiety. Accordingly, whilst distraction theories do offer a potential explanation of increased performance, the mechanism through which this operates is contingent upon the experience of heightened cognitive anxiety.

1.4.1.2 Self-Presentation Model

In contrast to attentional theories, which centre on the mechanisms behind performance fluctuations in response to the appraisal of increased anxiety, the self-presentation model focuses on how such anxiety may occur in the first instance. Self-presentation refers to the process by which people monitor and attempt to control how they are perceived by observers (Leary, 2016). Broadly, when an athlete feels under the ‘spotlight’, and they are uncertain of achieving the desired positive impression, they are likely to experience increased anxiety (Mesagno et al., 2011). Such self-presentation concerns may be exacerbated if athletes’ also hold high levels of athletic identity (i.e., the extent to which they identify with being an athlete; Mesagno & Beckmann, 2017). Accordingly, these self-presentation concerns, and the subsequent experience of anxiety, precedes attentional shifts (i.e., the self-presentation model precedes self-focus or distraction).

1.4.1.3 Limitations of Anxiety-Performance Theories

Attentional theories and the self-presentation model may be incomplete explanations of clutch performance as they: (1) are predicated on the initial experience

of anxiety; and (2) in some instances, cannot explain how performance could be improved. Whilst often confounded, pressure and anxiety are distinct concepts (Eysenck & Wilson, 2016). Specifically, whilst pressure may result in anxiety, it is unclear if this is always the case. As such, theories which centre on the experience of anxiety may not be able to explain how clutch performances occur without this negatively toned emotional experience. Meanwhile, whilst distraction theories explain that maintained, or increased, performance is a result of increased mental effort (Eysenck et al., 2007), self-focus theories do not specify the mechanisms through which performance may be improved (Masters, 1992). Indeed, this appears to raise the broader question of whether these theories are aimed at explaining clutch performance, or the prevention of choking (and further, the extent to which these two constructs differ). Therefore, whilst anxiety-performance theories are the most common explanations provided in research examining clutch performance, these theories appear to have several limitations in explaining the mechanisms behind current understandings of clutch performance.

1.4.2 The Integrated Model of Flow and Clutch States

The Integrated Model of Flow and Clutch States purports that there are two distinct, yet overlapping, optimal psychological states which underlie excellent performance in sport and exercise (Swann et al., 2017a, 2017b, 2019). Specifically, these are termed flow, and clutch, states. This model emerged from research examining flow and suggested that instead of the widely-held notion that there is only one optimal psychological state underlying excellent performance – flow – there seemed to be a second state, which had overlapping, yet distinct, characteristics. Specifically, these overlapping characteristics included the experiences of enjoyment, enhanced motivation, perceived control, altered perceptions of time, absorption, and confidence (Swann et al., 2017b). Distinguishing this second state from flow, meanwhile, was the

experience of complete and deliberate focus, heightened awareness, intense effort, absence of negative thoughts, heightened arousal, and automaticity of skills (Swann et al., 2017a). As this second state appeared to occur during situations that mirrored descriptions of when clutch performances occurred (i.e., pressure contexts which often involved an outcome being on the line, or occurred towards the end of an event), and further, contained experiential elements that appeared to correspond with clutch performance (i.e., a sense of performing well under pressure), this second state was termed a clutch state. As such, clutch states are defined as the psychological state purported to underlie clutch performance (Jackman et al., 2017; Swann et al., 2019).

Within the Integrated Model of Flow and Clutch States it is suggested that clutch states occur during performance contexts characterised by important moments, being in contention to achieve goals (i.e., winning, achieving personal best, summiting a mountain), and often (but not always) occur towards the end of a competition or event (Swann et al., 2017b, 2019). Underlying these different contexts is the experience of pressure. The Integrated Model of Flow and Clutch States also specifies a process underlying how clutch states occur. Specifically, clutch states are proposed to occur following an initial challenge appraisal, in which the performer becomes aware of the importance of the situation towards achieving their goals (e.g., they realise they are in contention to win the event). Following this challenge appraisal, performers set specific goals in relation to the situational demands (e.g., to win the event). In response to setting these specific goals, performers are then reported to make a conscious decision to step up their effort and intensity, and experience a clutch state (Swann et al., 2017b, 2019). Whilst this process of occurrence for clutch states stems from qualitative work, there is some experimental evidence supporting the role of specific goals in the occurrence of clutch states. Specifically, Schweickle et al. (2017) reported that in a

cognitive task, participants who were set specific, challenging goals reported more clutch-like experiences than those prescribed open goals (which are suggested to precede flow states). In sum, clutch states are reported to occur during pressure contexts, and follow a process of making a challenge appraisal, setting specific goals, and then responding with increased effort and intensity.

1.4.2.1 Limitations of the Integrated Model of Flow and Clutch States

The primary limitation of the Integrated Model of Flow and Clutch States as an explanation of clutch performance is the unclear relationship between clutch states and clutch performance. Specifically, as there are still questions over how to define (e.g., is increased performance required? Or is maintained performance sufficient?) and conceptualise (e.g., is clutch performance a behaviour, trait, or outcome?) the construct of clutch performance, it is difficult to ascertain if clutch states are a necessary, or sufficient, condition of clutch performance. For example, it is unclear whether to constitute as a clutch state, one also needs a performance outcome or behavioural change, or whether the experiential elements and the perception that the performance has gone well, are sufficient. Indeed, Swann et al. (2017a, 2017b, 2019) drew on both Otten (2009) and Hibbs (2010) when defining clutch performance, making it difficult to determine the performance conditions which bound clutch states (i.e., increased or maintained performance). As such, whilst the evidence for clutch states is promising, questions remain over the relationship between clutch states and clutch performance, which inherently relies on how clutch performance is defined and conceptualised.

1.5 Moving Forward: A Critical Examination of the Definition and Conceptualisation of Clutch Performance

Conceptual examination, and if necessary refinement, is a core aspect of scientific progress (Bunge, 2009). It has so far been highlighted that there are significant

definitional and conceptual issues underlying clutch performance research. To progress the field, therefore, it appears crucial to critically examine how clutch performance is defined and conceptualised. Many sport psychology constructs have undergone similar conceptual examination, such as: choking (Mesagno & Hill, 2013a); thriving (Brown et al., 2017); expert performance (Swann et al., 2015); resilience (Fletcher & Sarkar, 2013); and, extreme sport (Cohen et al., 2018). Such examination often results in conceptual refinement, and the proposition of new or altered definitions (e.g., Mesagno & Hill, 2013a). The purpose of conceptual refinement is not to decrease the amount of dissent within a field, but rather, increase the richness of research and argument (Bunge, 2009). As such, it is important that when definitional or conceptual issues have been raised, constructs undergo examination to see if they can be further elucidated

A potential outcome of conceptual refinement is redefinition, which changes the meaning of a term (Bunge, 2009). Such a process has been demonstrated in the field of choking. Beginning with a review of choking which highlighted that the field had significant definitional issues (Hill et al., 2010a), Hill and colleagues then carried out investigations into how choking should be defined, by drawing on athlete experiences (Hill et al., 2010b, 2011). In response to new empirical information and understanding (e.g., Bunge, 2009), a new operational definition of choking was proposed (Mesagno & Hill, 2013a), which has now been widely adopted (e.g., Gröpel & Mesagno, 2019). This thesis adopted a similar approach, in which the literature on clutch performance was first reviewed, and then followed by an in-depth investigation of athletes' experiences of clutch performance, which ultimately informed a refined understanding of this construct.

In this project, an athlete-centred approach was taken to examining the conceptual foundations of clutch performance. In examining definitions, the view was

adopted that definitions are contextually based, socially constructed, and serve different functions (Laas, 2017). Indeed, this view links with a broader critical realist philosophy which underlined the current thesis, which at an epistemological level, assumes our knowledge is socially constructed (Maxwell, 2012). Accordingly, the criteria by which definitions are judged may differ depending on the context in which they are used, and further, the purpose for which they are used (Gupta, 2015). In this light, the current thesis examined definitions of clutch performance against the extent to which they represented athletes' views, understandings, and experiences of clutch performance. An athlete-centred approach to assessing clutch performance is important because definitions should reflect the needs and values of those affected by a definition's usage (Laas, 2017). Moreover, any interventions to promote clutch performance in athletes, which will inherently be based on a definition, should reflect athletes' needs (Mesagno & Hill, 2013b). As such, this thesis considered the extent to which current definitions and explanations of clutch performance reflected the experience of athletes. In doing so, I sought to provide an athlete-centred understanding of what clutch performance is, and subsequently, how it should be defined.

1.6 The Current Research Program

1.6.1 Aims of the Thesis

This thesis reported on a program of research examining the conceptual foundations of clutch performance. Specifically, this thesis had the following sub-aims:

- 1) Systematically collate, synthesise, and review the current research on clutch performance in sport and exercise, and identify the key areas requiring further investigation;
- 2) Explore when, and under what conditions, clutch performances may occur;

- 3) Understand if clutch performance should be assessed as an objective, or subjective, performance phenomenon;
- 4) Examine the performance level required for clutch performance; and,
- 5) Provide a refined understanding of what clutch performance is, and how it should be defined.

1.6.2 Structure of the Thesis

1.6.2.1 Review of the Literature

To provide an evidence-based foundation for this program of research, Chapter 2 (Study 1) began with a systematic review of the current body of literature on clutch performance in sport and exercise. This chapter consisted of a narrative synthesis of 27 published studies and reported on how clutch performance has been defined, conceptualised, and measured within the literature, as well as an assessment of the level of supporting evidence for the construct. A component of this synthesis involved evaluating the strength of different approaches to measuring clutch performance. Indeed, this evaluation guided the methodology adopted within the subsequent empirical chapters of the thesis. Specifically, qualitative and mixed methods approaches were held to represent the most appropriate methods for examining clutch performance. Chapter 2 concluded with four key recommendations for progressing the field of clutch performance, which provided the foundation for the research questions explored in Chapters 3 (Study 2), 4 (Study 3) and 5 (Study 4). Specifically, these included that: (1) research should examine individual episodes of clutch performance, rather than clutch ability (Chapters 3, 4, and 5); (2) it is important to understand when clutch performances may occur, and how pressure may influence performance (Chapter 3); (3) researchers should explore whether clutch performance should be assessed and identified using objective, or subjective, performance indicators (Chapter 4); and (4)

understanding the performance level required for clutch performance is required for resolving conflicting definitional and measurement issues (Chapter 5).

1.6.2.2 Empirical Research

The empirical phase of this research program is reported in Chapters 3, 4 and 5. Broadly, these three studies shared the overarching goal of understanding athletes' experiences and assessments of performing well under pressure. A brief overview of the aims and design of these Chapters is provided below.

Chapter 3 (Study 2) was aimed at exploring when, and under what conditions, clutch performances may occur (i.e., what does the "clutch" in clutch performance mean to athletes?). Further, how athletes perceived pressure to influence their performance was also examined. A qualitative methodology was adopted in which 16 athletes, ranging from recreational to semi-elite levels of expertise (e.g., Swann et al., 2015), partook in semi-structured, event-focused interviews following performing well in a high-pressure event (e.g., finals). A reflexive thematic analysis was conducted to analyse these data. It was concluded in Chapter 3 that the appraisal of clutch situations was episodic, fluctuated, and may be influenced by a range of internal and external factors. Further, this appraisal of pressure was reported to have a dynamic influence on performance, whilst the emotional responses to pressure appraisal varied.

Chapter 4 (Study 3) was aimed at understanding whether athletes identify clutch performances using objective indicators (e.g., performance statistics) or subjective indicators (e.g., perceived performance). A mixed methods multiple case study design was utilised. Four semi-elite basketballers (e.g., Swann et al., 2015) performances were observed during high-pressure matches, and their performance statistics examined. Further, these basketballers completed a screening questionnaire, and partook in an event-focused interview. Within-case analyses, followed by a cross-case analysis, were

conducted on these data. It was reported in Chapter 4 that basketballers drew on both objective, and subjective, performance indicators to identify their own clutch performances. Whilst objective indicators were reported as important, these were often assessed through a subjective lens. It was concluded in Chapter 4 that subjective reflections are important in identifying and assessing clutch performances.

Chapter 5 (Study 4) was aimed at examining the performance level (i.e., increased or maintained) required for clutch performance. Further, the performance benchmarks that clutch performances were compared against was also explored in Chapter 5. A qualitative methodology was adopted in which 24 athletes partook in event-focused interviews following either positive objective, or subjective, performance in a high-pressure event. A reflexive thematic analysis was conducted on these data. It was reported in Chapter 5 that athletes utilise self-referenced goal achievement to assess their own clutch performances. Such goals were performance focused, often emerged *during* the performance, and were influenced by the performance context. As such, views surrounding the performance level required for clutch performance depended on the athlete's own goals, as well as the indicators used to assess their performance. It was also reported in Chapter 5 that athletes often did not employ a performance benchmark, but rather assessed clutch performance on the individual performance itself. It was concluded that clutch performance, therefore, may be considered a largely subjective, and goal dependent phenomenon.

1.6.2.3 Discussion of Findings and a Refined Definition and Conceptualisation of Clutch Performance

Chapter 6 outlined the conclusions drawn from all previous Chapters. Specifically, this section provided a refined definition and conceptualisation of clutch performance and clutch moments, discussed the theoretical implications of such an

understanding, and considered the applied implications of the findings from this thesis. Further, the limitations of this program of research were discussed, and suggestions were provided for future research.

1.6.3 Significance of the Thesis

Definitional and conceptual clarity is fundamental to the development of measurement and theory, which are critical to informing applied intervention and practice (Cooper et al., 2001; Cunningham, 2015; Doherty, 2013; Wacker, 2004). In exploring the above aims, the research reported in this thesis provides a significant contribution to the field of performance under pressure by proposing a refined definition and conceptualisation of clutch performance. This thesis represents the first program of research to consider, and refine, the definition of clutch performance based on athletes' experiences and perceptions of performing under pressure. Further, the empirical research conducted in this thesis stems directly from a systematic review and synthesis of the clutch performance literature, which identified the most pressing issues preventing meaningful progress within the field, and suggested key areas of investigation to resolve these issues. The findings from this thesis provide the foundation for several future research avenues, including the development of a measure of clutch performance and considerations for the development of a theory of clutch performance, which will ultimately assist practitioners and coaches in understanding how to facilitate clutch performance in athletes.

Chapter 2: Clutch Performance in Sport and Exercise: A Systematic Review

2.1 Foreword

The literature presented in Chapter 1 provided the conceptual foundations for the current thesis, by reviewing key constructs and theories related to clutch performance. Moreover, inconsistencies between prominent definitions of clutch performance were highlighted, and the implications of such inconsistencies were discussed. To build on, and provide further depth to, the issues discussed in Chapter 1, the aim of the following Chapter (Study 1) was to systematically review the literature on clutch performance in sport and exercise. To date, no systematic review has been conducted to examine and critically evaluate the literature on clutch performance. As such, the aim of Study 1 was to systematically review, synthesise, and evaluate the existing research on clutch performance. Specifically, Study 1 addressed the following research questions: (i) what research designs have been used to examine clutch performance?; (ii) how has clutch performance been defined?; (iii) what theoretical frameworks have been used to explain clutch performance?; (iv) how has clutch performance been measured?; (v) is there supporting evidence for clutch performance in sport and exercise?; and, if so, (vi) what is known about the occurrence of clutch performances?

The ensuing chapter has been published (excluding abstract and reference list) in the *International Review of Sport and Exercise Psychology* (Schweickle et al., 2020), and reformatted for this thesis.

2.2 Introduction

Increased performance under pressure in sport and exercise has been referred to as *clutch performance* (Otten, 2009; Swann et al., 2019). The term clutch performance is frequently applied by the media to many high-profile, celebrated sporting moments, such as Michael Jordan scoring with five seconds remaining to win the 1998 National

Basketball Association (NBA) Championship (Woodyard, 2018); the New England Patriots' 31-point, second half comeback to win the 2017 Super Bowl (Hurley, 2019); and Sergio Aguero's injury time goal to win Manchester City's first Premier League title in 2012 (Hart, 2017). Recent evidence suggests that such clutch performances are intrinsically rewarding and motivating (Swann et al., 2017a), and that clutch performances can also occur in exercise settings (Swann et al., 2019). As these performances occur under pressure, clutch performance has been considered psychological in origin (Otten, 2013). Facilitating clutch performance is therefore of great interest to researchers and practitioners in the field of sport and exercise psychology (Marchant et al., 2014; Otten, 2013)

The phrase "in the clutch" was first used in a 1929 New York Times article to describe when a baseball batter hits a safe "blow" at an opportune moment (Safire, 2005). Despite having a long history of colloquial use (e.g., West & Libby, 1969), scientific definitions of clutch performance have only emerged relatively recently. The most prominent definitions of clutch performance are those provided by Otten (2009) and Hibbs (2010). Otten (2009) defined clutch performance as "any performance increment or superior performance that occurs under pressure circumstances" (p. 584). Hibbs (2010), meanwhile, defined clutch performance as:

when a participant in competitive sport succeeds at a competitive-related, challenging task during a clutch situation, is aware that the performance occurs during a clutch situation, possesses the capacity to experience clutch situation-related stress, cares about the outcome of the contest, and succeeds primarily due to skill rather than luck or cheating (p. 55).

A clutch situation, according to Hibbs (2010), is "a point in a competitive sport where the success or failure of the participants has a significant impact on the outcome of the

contes” (p. 48). Researchers have highlighted, however, that definitions of clutch performance remain problematic. For example, Seifreid and Papatheodorou (2010) noted that “clutch exists as a challenging concept which is inadequately defined in sport” (p. 92), whilst Mesagno and Hill (2013a) stated that clutch performance is “ambiguously defined” (p. 275). Swann et al. (2017a), meanwhile, suggested that “standard definitions of clutch performance may require refinement” (p. 2278).

Definitional critiques have also centered on the situations in which clutch performances occur, based on evidence that clutch performances have been reported outside of competitive sport settings, such as training (Swann et al., 2017a) and in exercise contexts (Swann et al., 2019). As such, questions remain over how to adequately define clutch performance, as well as the situations in which such performances occur.

Theoretical explanations of clutch performance have emerged from two different approaches. Traditionally, theories of performance under pressure have focused on choking, defined as “an acute and considerable decrease in skill execution and performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure” (Mesagno & Hill, 2013a, p. 274). For example, attentional theories propose that, in response to anxiety, athletes either divert attention towards the self (e.g., self-focus theories; Beilock & Carr, 2001), or away from task-relevant cues (e.g., distraction theories; Oudejans et al., 2011). More recently, an Integrated Model of Flow and Clutch States has been proposed (Swann et al., 2017b, 2019). This model outlines that a specific psychological state may underlie clutch performance (i.e., clutch states), which overlaps with, yet is distinct from, the experience of flow (a deeply focused, absorbing, and autotelic experience; Csikszentmihalyi, 2002). As such, explanations of clutch performance have emerged out of research centred on either choking or flow.

A range of measurement approaches have been adopted to examine clutch performance. Research in this field began with Cramer's (1977) investigation into the existence of clutch hitters in baseball. For the subsequent 30 years, clutch performance research was exclusively conducted within the sport of baseball, through the method of sabermetrics (i.e., the statistical analysis of baseball; Costa et al., 2019). Generally, such archival approaches have typically focused on whether clutch performance exists as an observable phenomenon in sport. In the last decade, however, there has been a considerable increase in the quantity and diversity of research examining clutch performance. For example, measurement approaches have extended to include qualitative methodologies that focus on the psychological state underlying clutch performance (e.g., Swann et al., 2017a), whilst experimental approaches have included measuring variables such as subjective experience (e.g., anxiety), technique changes in sport-specific skills (e.g., golf-putting stroke), and objective performance (e.g., putting accuracy) during clutch performances (e.g., Gray & Cañal-Bruland, 2015). In parallel, research has expanded into a wide range of sports beyond baseball, such as basketball (e.g., Otten, 2009), golf (e.g., Hill & Hemmings, 2015), and tennis (e.g., Jetter & Walker, 2015), as well as exercise (e.g., Swann et al., 2019).

There are fundamental questions surrounding the strength of evidence underpinning clutch performance as an observable phenomenon in sport. For example, Wallace et al. (2013) found no evidence for NBA players displaying clutch performances during the fourth quarter of playoff games. Similarly, Birnbaum (2008) demonstrated that clutch performance in Major League Baseball (MLB) was not a predictor of future clutch performances, casting doubt on the notion that certain players are more prone to producing clutch performances than others. In contrast, Jetter and Walker (2015) found that higher-ranked professional tennis players improved their

winning percentage, both overall and in decisive sets (i.e., tiebreak sets), during important competitions (i.e., Grand Slam tournaments). This finding suggested that higher-ranked players are able to produce clutch performances when the incentives were greatest. Meanwhile, Solomonov et al. (2015) indicated that NBA players with reputations for being clutch players (i.e., known for producing repeated clutch performances) increased their output (e.g., points scored) in the last five minutes of critical games. However, these players' overall base performance (e.g., shooting percentage) did not increase. Solomonov et al. (2015) concluded that this finding provided limited evidence of clutch players, in that whilst these players scored more points, this was a consequence of shooting more often, rather than improved shooting accuracy. Thus, there is contradictory evidence as to whether clutch performance exists in sport.

Against the backdrop of definitional issues and conflicting evidence, a systematic review of clutch performance is both timely and important in terms of providing guidance on future directions for the field. Systematic reviews aim to be “comprehensive, methodical, explicit, transparent, and as unbiased as possible in the questions they explore and how they explore them” (Siddaway et al., 2019, p. 97). Thus, systematic reviews aim to produce a summary of the literature that explores relations, contradictions, and gaps in a research field and the reasons for these. In turn, systematic reviews can allow broad and more robust conclusions to be drawn, which can outline future research directions and inform practice (Siddaway et al., 2019). Furthermore, systematic reviews have previously been employed as a method to review and bring clarity to constructs with definitional issues in the field of sport and exercise psychology (Dohme et al., 2017; Swann et al., 2015). These aspects are highly relevant

to the field of clutch performance, which has yet to be systematically reviewed and synthesised, and may benefit from greater clarity and direction.

The aim of this study was to systematically review, synthesise, and evaluate the existing research on clutch performance. Specifically, this review addressed the following research questions: (i) what research designs have been used to examine clutch performance?; (ii) how has clutch performance been defined?; (iii) what theoretical frameworks have been used to explain clutch performance?; (iv) how has clutch performance been measured?; (v) is there supporting evidence for clutch performance in sport and exercise?; and, if so, (vi) what is known about the occurrence of clutch performances? In turn, this review seeks to address existing issues currently facing the field by providing definitional and conceptual clarity. Further, this review aimed to identify future directions for research on clutch performance, which can increase understanding of how practitioners, athletes, and exercisers can facilitate successful performance under pressure.

2.2 Methods

2.2.1 Protocol

The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). The PRISMA checklist is reported in Appendix C. The search strategy included 10 electronic databases, representing a combination of sport- (SPORTDiscus) and psychology- (PSYCInfo, PSYCArticles) specific databases, and general scientific databases (Academic Search Complete, SCOPUS, Pub Med, Medline, Web of Science, Science Direct, ProQuest Central). The final search was conducted in October 2019.

Potential search terms were initially developed by the authors, all of whom have published in the area of clutch performance. Combinations of these search terms were

trialed by the first author on the EBSCOhost database. These preliminary searches were reviewed for relevance, and the search repeated until the most effective combination of search terms were identified (Siddaway et al., 2019). The aim of this process was to limit the amount of irrelevant results, whilst ensuring all relevant literature was retained. The final search string was: [clutch] AND [(sport* OR exerci* OR physical* OR athlet*)]. The singular use of the term *clutch*, rather than *clutch performance*, was chosen to capture terminology relevant to the concept, but that may not contain the term performance (e.g., hitting in the clutch, clutch shooting). The search terms physical* (e.g., physical fitness) and athlet* (e.g., athlete) were included as synonyms to supplement sport* and exerci*. Exercise was included in this review as recent evidence suggests that clutch performances may also occur in exercise settings (e.g., Swann et al., 2019). Where possible, the first block was searched in the title, abstract, and keyword field, whilst the second block was searched in the full text field. The full search strategy for each database is presented in Appendix D.

2.2.2 Eligibility Criteria

Inclusion and exclusion criteria were employed to ensure that the scope of the review was clearly defined, and that all literature relevant to the aims of the review was identified (Siddaway et al., 2019; Centre for Reviews and Dissemination, 2009). Criteria for inclusion were that articles must: (a) be a peer-reviewed journal article published in the English language; (b) report original empirical evidence (including original analyses of secondary data); (c) be published prior to October 2019 (when the final search was undertaken); and, (d) examine the nature, existence and/or occurrence of clutch performance in participants' engaging in sport¹ (including sport-specific skills)

¹ “An activity involving physical exertion, skill and/or hand-eye coordination as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organizations; and may be participated in either individually or as a team” (WHO, 2018, p. 101)

or exercise², as defined by the World Health Organisation (WHO, 2018). Articles were excluded that (e) referred to clutch as a mechanical apparatus (e.g., a clutch in motorcycle sports). Following initial scoping of the literature, inclusion of original analyses of secondary data were deemed important for the current review. Specifically, archival studies comprise a significant portion of the extant literature, and consideration of these studies is pertinent to several aims of the review (e.g., how clutch performance has been measured).

2.2.3 Screening Process

Following database searching, articles were imported and screened in Endnote X8 reference management software (Thomas Reuters, California), during which duplicates were automatically removed. Missed duplicates during this stage were removed manually during the screening process. Articles were independently screened at the title, abstract, and keyword level for relevance by the first and third author. Studies were retained if they contained the term clutch in the title, abstract, or as a keyword, appeared to involve participants in the domain of sport or exercise, and were not referring to clutch as a mechanical apparatus (e.g., in motorsports). A number of steps were followed to ensure that the screening process was as comprehensive as possible (Siddaway et al., 2019). If the relevance of an article was uncertain, the full text was obtained for further screening. Once full texts were obtained for all identified studies, a further manual search was conducted by the first author. Specifically, reference lists of all identified studies were searched, in addition to forward searching citations of identified studies using Google scholar. This process was repeated with each new study added. Lastly, authors who had two or more first-author publications at this

² “A subcategory of physical activity that is planned, structured, repetitive, and purposive, in the sense that the improvement or maintenance of one or more components of physical fitness is the objective” (WHO, 2018, p. 98)

stage of screening were contacted and asked to suggest any relevant literature that was not presently included (Siddaway et al., 2019). This resulted in two additional studies (Jackman et al., 2020; Maher et al., 2018) being included, which had been published after the initial search date. After completing these steps, the first and third authors screened the full texts in accordance with the eligibility criteria. In three cases inclusion was uncertain (Cramer, 1977; Cramer & Palmer, 2008; Deane & Palmer, 2006) because it was not initially clear if original data had been analysed. Upon repeated readings and discussions, the reviewers agreed to include these papers as it was determined that original data had been analysed.

2.2.4 Data Extraction and Synthesis

Data were extracted by the first author. These data included: (i) study characteristics (methodology, study design, aims, hypotheses, theoretical framework); (ii) participant characteristics (sample size, gender, mean age, sport, expertise); and (iii) key findings relevant to the aims of the review (definitions, existence and occurrence of clutch performance). Given the heterogenous nature of the included studies, a narrative synthesis was undertaken. A narrative synthesis summarises and explains findings textually (Popay et al., 2006), with the aim of generating new insights (Thomas et al., 2012). A preliminary synthesis was initially conducted by tabulating textual summaries of the data according to the review aims. Tabulation is valuable in developing initial summaries of the included studies, as well as facilitating identification of patterns across studies (Higgins et al., 2019). Following this preliminary synthesis, the relationships between studies were explored by examining factors that may explain differences in findings between studies (Popay et al., 2006). This was an important step as two of the five review aims related to empirical findings. An interpretative approach was taken, in which findings of the included studies were filtered according to the conceptual

assumptions and methods adopted (Drisko, 2019). Specifically, this involved examining how research design, definitions, and measurement may have informed the results of individual studies.

2.2.5 Quality Appraisal

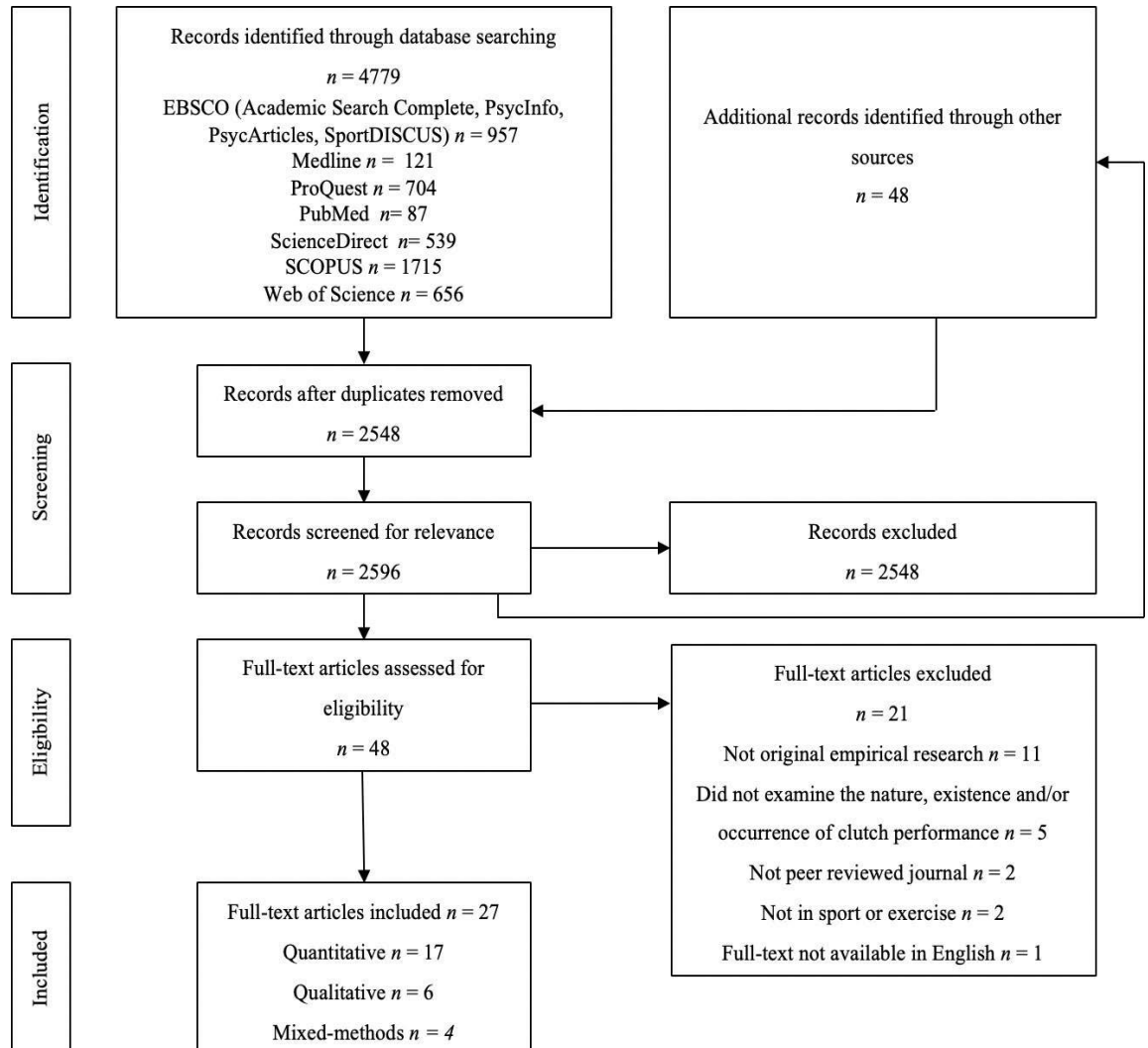
Study quality was appraised using the 16-item assessment tool (QATSDD) developed by Sirriyeh et al. (2012).³ The QATSDD can be used to assess the quality of qualitative, quantitative, and mixed methods studies. However, criterion 14 of the tool was excluded on grounds of being ineffective for assessing reliability in qualitative research (Jaarsma & Smith, 2018; Smith & McGannon, 2018), whilst criterion 9 of the tool was excluded when scoring archival studies, as this criterion was deemed inappropriate for archival designs by the research team.

To limit bias, and facilitate transparency and trustworthiness, authors of the present review who were also authors on an included study were not involved in the quality assessment of that study. As such, the first author assessed 26 of the 27 studies, whilst the second, third, and fourth authors all assessed eight studies each. For the remaining studies, two independent reviewers were used. The first independent reviewer assessed four studies (three in conjunction with the first author, one in conjunction with the second independent reviewer), whilst the second independent reviewer assessed one study. All studies were assessed by two reviewers. As outlined in Sirriyeh et al. (2012), the reviewers met to discuss and deliberate on any scoring differences, following which a final score was determined by mutual agreement.

³ To ensure the most appropriate tool was selected, three appraisal tools were piloted with five of the included papers, which were of a diverse methodology. These were the QATSDD (Sirriyeh et al., 2012), Mixed Methods Appraisal Tool (Pluye et al., 2011), and the QualSyst (Kmet et al., 2004). Following piloting, the QATSDD (Sirriyeh et al., 2012) was considered the most appropriate tool for the present review.

2.3 Results

In total, 4779 studies were identified across three separate searches. Following duplicate removal, 2548 studies were independently screened for relevance. The majority of studies screened at this stage were removed as they were not in the domain of sport or exercise (clutch is a prominent term in the fields of zoology and mechanical engineering). This process left 34 studies to be screened at the full text stage. An additional manual search identified 14 potentially relevant articles to be screened at the full text stage. Thus, 48 articles were screened at the full text stage. Following full text screening, 21 articles were excluded. Reasons for exclusion were that the studies: were not original empirical research ($n = 11$); did not examine the nature, existence and/or occurrence of clutch performance ($n = 5$); were not peer reviewed ($n = 2$); were not in the domain of sport or exercise ($n = 2$); and, were not written in English ($n = 1$). Accordingly, 27 articles were included in the systematic review. The PRISMA diagram of this process is provided in Figure 2.1.

Figure 2.1*Flow diagram of database search and record screening*

2.3.1 Characteristics of Included Studies

Details of study characteristics, including type of sport/exercise, sample size, methodology, methods, approach to research design, and key findings relevant to aims of the review are presented in Table 2.1. In total, 17 studies were quantitative, six qualitative, and four mixed methods. Of the quantitative studies, 13 employed archival methods, whilst the remaining four studies used experimental methods. In the

qualitative studies, both career-based and event-focused⁴ semi-structured interview methods were used. Three mixed method studies used a combination of psychometric measures and interviews (see Table 2.1 for measures), whilst one mixed methods study (Swann et al., 2016) included performance observation, naturalistic performance data, and event-focused, semi-structured interviews.

There were 545 (304 male, 241 female) participants from studies that collected primary data. Data were observed for at least 3652⁵ individuals from studies that obtained secondary data (i.e., archival methods). Meanwhile, six studies did not report the sample size in adequate detail to report. Participants were examined in a range of sports, including: baseball ($n = 8$); basketball ($n = 6$); golf ($n = 5$); mixed sport ($n = 3$); tennis ($n = 1$); and American football ($n = 1$). A mix of participants engaging in both sport and exercise was examined in two studies (Swann et al., 2017a, 2017b), whilst only participants in exercise were examined by Swann et al. (2019).

2.3.2 Quality Appraisal

Table 2.1 also displays quality appraisal scores from the QATSDD (Sirriyeh et al., 2012) for the included studies. The mean quality appraisal score across all studies was 61%. Archival studies generally received the lowest quality scores, on account of lacking clear conceptual frameworks, not justifying sample sizes, and omitting discussion of strengths and weaknesses (a full score for each paper by category is found in Appendix E). Experimental studies, meanwhile, ranged from scores of 50% (McEwan et al., 2012) to 71% (Otten, 2009). Qualitative and mixed method studies

⁴ Career-based interviews seek general understanding of a phenomenon over an athlete's career or significant period of time (Swann et al., 2018). Event-focused interviews collect data soon after one specific event (e.g., within hours/days), which allows for more detailed and chronological recall of the event (Swann et al., 2018)

⁵ The sample size from Otten & Barrett (2013) was not included in this calculation, as it was unclear how many athletes appeared more than once (e.g., as pitching, batting, and team statistics were calculated for multiple seasons, meaning the same athlete may have been observed more than once)

were generally the highest scoring and, with the exception of Owens et al. (2016; 38%) and Maher et al. (2018; 56%), all scored above 80% (see Table 2.1).

Table 2.1*Overview of Included Studies*

ID	Study	Sport/Exercise	Methods	Theory/Model	Sample size	Research Approach	Key findings relevant to existence of clutch performance and/or occurrence of clutch performance	QA
Quantitative								
1	Birnbaum (2008)	Baseball	Archival	N/S	N/S	Ability	No evidence of clutch hitters	31%
2	Birnbaum (2009)	Baseball	Archival	N/S	N/S	Ability	No evidence of clutch pitchers	23%
3	Brooks (1989)	Baseball	Archival	N/S	N/S	Ability	No evidence of clutch hitters	44%
4	Cao et al. (2011)	Basketball	Archival	NET	N/S	Ability	No evidence of clutch free-throw shooting; shooters generally choke	54%
5	Cramer (1977)	Baseball	Archival	N/S	N/S	Ability	No evidence of clutch hitters	31%
6	Cramer & Palmer (2008)	Baseball	Archival	N/S	897	Ability	No evidence of clutch hitters	44%
7	Deane & Palmer (2006)	Baseball	Archival	N/S	501	Ability	No evidence of clutch pitchers	44%
8	Gray & Cañal-Bruland (2015)	Golf	Within-subjects experimental	Self-focus	25	Episode	Clutch performances characterised by lower heart rate, better putting accuracy, and more stable putting kinematics than choking performances	62%
9	Gray et al. (2013)	Golf	Within-subjects experimental	Self-focus	13	Episode	Clutch performances characterised by better putting accuracy and improved putting kinematics	64%
10	Jetter & Walker (2015)	Tennis	Archival	N/S	853	Ability	Provides evidence for clutch ability effect in tennis	69%
11	McEwan et al. (2012)	Golf	Between-subjects experimental	Self-focus	119	Episode	Participants in high-pressure warm up condition had better clutch performance than those in low-pressure warm up condition	50%
12	Otten (2009)	Basketball	Between-subjects experimental	Self-focus	243	Episode	Perceived control was the strongest predictor of clutch free-throwing shooting performance	71%
13	Otten & Barrett (2013)	Baseball	Archival	Self-focus	2936 ^c	Ability	Mixed evidence of clutch performance. Regular and post-season performance were correlated; however, individuals and teams were capable of clutch (and choke) performances.	72%

14	Ruane (2005)	Baseball	Archival	N/S	727	Ability	No evidence of clutch hitters	44%
15	Solonomov et al. (2015)	Basketball	Archival	Self-focus & Distraction	196	Ability	Partial evidence for clutch ability; clutch players increase individual effort, however shooting accuracy remains unchanged	74%
16	Wallace et al. (2013)	Basketball	Archival	N/S	478	Ability	No evidence of clutch shooters	46%
17	Worthy et al. (2009)	Basketball	Archival	RFT	N/S	Ability	No evidence of clutch free-throw shooting; shooters generally choke	38%
Qualitative								
18	Hill & Hemmings (2015)	Golf	Career-based SSI	Self-presentation	6	Episode	Coping responses associated with clutch performances included pre- and post-shot routine, cognitive restructuring, simulated practice, acceptance, and withdrawal	85%
19	Hill et al. (2017)	Mixed ^a	Career-based SSI	Self-presentation	9	Episode	Proactive coping strategies, holding acquisitive-agentive beliefs, positive appraisal of anxiety, and perceived control were identified to precede and characterise clutch performances.	85%
20	Maher et al. (2018)	Basketball	Career-based SSI	Self-focus & Distraction	7	Episode	Broad range of influencing variables, mental skills and management strategies facilitate performance under pressure	56%
21	Swann et al. (2017a)	Mixed ^a	Event-focused SSI	IMFCS	16	Episode	Clutch states, reported to consist of 12 characteristics, appeared in a range of sports and exercise activities, across a range of expertise	90%
22	Swann et al. (2017b)	Mixed ^a	Event-focused SSI	IMFCS	26	Episode	Clutch states occurred in contexts of importance, where an outcome is on the line. The occurrence of clutch states included challenge appraisal, setting specific goals, and a decision to increase effort	90%
23	Swann et al. (2019)	Mixed ^b	Event-focused SSI	IMFCS	18	Episode	Suggest themes such as achievement, competition, and pressure, can occur outside of sport and provide a context for the occurrence and experience of clutch states in exercise	85%
Mixed methods								
24	Jackman et al. (2017)	Mixed ^a	Event-focused SSI; FSS-2; FQ	IMFCS	10	Episode	Most salient features distinguishing clutch states from flow included intense effort, heightened awareness, and deliberate focus.	84%
25	Jackman et al. (2020)	Mixed ^a	Event-focused SSI; FSS-2; FQ; MTQ48	IMFCS	16	Episode	Athletes high in mental toughness experience clutch states more frequently and sustain these longer than athletes low in mental toughness	80%
26	Owens et al. (2016)	American Football	Career-based SSI; ProScan Survey	Distraction	27 ^d	Ability	Coach identified clutch players more likely to have personalities high in dominance, low in pace, and low in conformity	38%

27	Swann et al. (2016)	Golf	Event-focused SSI; Observations; Performance data	IMFCS	10	Episode	Clutch state reported to underlie excellent performance. Occurrence of clutch state included awareness of the situation, setting specific goals, and a challenge appraisal leading to increased concentration	82%
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ID = Identification number; QA = Quality appraisal score; ^a Mixed sport; ^b Mixed exercise; SSI = Semi-structured interviews; FSS-2 = Flow State Scale-2 (Jackson & Eklund, 2002); FQ = Flow Questionnaire (Csikszentmihalyi & Larson, 1984); MTQ48 = Mental Toughness Questionnaire-48 (Clough et al., 2002); N/S = Not specified; NET = Neoclassic economic theory; Self-focus = Self-focus theory; Distraction = Distraction theory; RFT = Regulatory focus theory; IMFCS = Integrated Model of Flow and Clutch States; Self-presentation = Self-presentation model; ^c Total size of a mixed sample, including 835 pitchers, 1731 batters, and 370 teams, in which one individual may be in multiple categories; ^d This included 1 coach (interviewed) and 26 players (surveyed)

2.3.3 Research Design

There were two distinct approaches to how research was designed to examine clutch performance. The most common approach ($n = 14$) was to examine clutch performance over a series of related performances. For example, studies measured clutch performance across multiple games (e.g., Solomonov et al., 2015), consecutive seasons (e.g., Birnbaum, 2008), or entire careers (e.g., Deane & Palmer, 2006). These were primarily archival studies, but also involved one mixed methods study (Owens et al., 2016; see Table 2.1). Hibbs (2010) has previously termed this approach “clutch ability... when one is notable for delivering clutch performances” (p. 48). Accordingly, we term this the *clutch ability* approach.

The other approach ($n = 13$) was to examine clutch performance in isolated episodes of performance. For example, studies investigated a single experimental session (e.g., Otten, 2009), an isolated performance (e.g., Swann et al., 2016), or a number of isolated performances, which were considered unrelated, from the same athlete (e.g., Jackman et al., 2017). Studies examining isolated performance episodes were experimental, qualitative, or mixed methods in design (see Table 2.1). We term this the *clutch episodes* approach. These two approaches represent different conceptual perspectives on clutch performance, and consequently, have implications for how it should be measured. As such, the remainder of this Results section will consider, where possible, these two approaches separately.

2.3.4 Defining Clutch Performance

Definitions of clutch performance from the included studies are provided in Table 2.2. An explicit definition of clutch performance (or related concepts, see *clutch ability*, *clutch situations*, and *clutch states*) was not provided in 26% ($n = 7$) of the studies. Clutch was defined in terms of a performance (i.e., a performance under pressure; Swann et al., 2017a), as an ability (i.e., the ability to produce repeated clutch performances; Deane & Palmer, 2006), a situation (i.e., a high pressure or critical game situation; McEwan et al., 2012), or a

psychological state (i.e., the subjective experience underlying clutch performance; Swann et al., 2019). These different definitions are discussed below.

2.3.4.1 Clutch Performance

The most common definition ($n = 10$) of clutch performance was Otten's (2009) definition. This definition was the first instance in the included literature that clutch was defined in terms of performance, rather than in terms of an ability or situation. It is unclear, however, whether Otten's (2009) definition strictly refers to a singular performance episode. For example, two studies (Otten & Barrett, 2013; Solomonov et al., 2015), which measured clutch performance over multiple performances, employed Otten's (2009) definition. Six studies referenced Hibbs' (2010) definition of clutch performance. Of note, five of these studies also referenced Otten's (2009) definition. In these five studies, both definitions were viewed as complementary (i.e., used together – see Table 2.2), rather than compared or contrasted. Indeed, none of the included studies examined the implication of using different definitions of clutch performance on the same data (i.e., if using different definitions changed the findings). Lastly, Maher et al. (2018) defined clutch performance as “adaptive (e.g., clutch) responses” (p. 1) to pressure. The definition employed by Maher et al. (2018) is considerably vague, and it is unclear how, or if, this definition fits with either Otten's (2009) or Hibbs' (2010) definition of clutch performance.

2.3.4.2 Clutch Ability, Clutch Situations, and Clutch States

Clutch was defined as an ability in four studies. Two of these definitions were specific to baseball (Cramer & Palmer, 2008; Deane & Palmer, 2006), with the remaining definitions generalisable across sports (Jetter & Walker, 2015; Owens et al., 2016 – see Table 2.2). Interestingly, Owens et al. (2016) cited Otten's (2009) definition, but clearly positioned clutch as an ability (i.e., “a clutch athlete exhibits superior performance under pressure”;

Owens et al., 2016, p. 4). As above, it is unclear whether Otten's (2009) definition is episodic or can apply to studies examining clutch ability.

A definition of a clutch situation was provided in four studies. Baseball-specific definitions were provided in three of these studies (Birnbaum, 2008; Brooks, 1989; Ruane, 2005), whilst one study provided the broad definition of a clutch situation as "instances of high pressure" (McEwan et al., 2012, p. 144). Clutch states, meanwhile, were defined as the psychological state underlying clutch performances (Jackman et al., 2017; Swann et al., 2017b). Whilst both Jackman et al. (2017) and Swann et al. (2017b) also provided definitions of clutch performance, it is unclear if clutch states and clutch performance are two distinct constructs, or if they are interconnected (i.e., if the experience of clutch states is an inherent aspect of clutch performance, and vice versa).

2.3.4.3 Comment

To date, various approaches to examining and defining clutch performance have been employed in the literature. It is therefore important that consistent terminology is used for the remainder of the Results. Accordingly, *clutch performance* will be used as an umbrella term, incorporating both clutch ability (i.e., clutch performance over a series of related performances) and clutch episodes (i.e., clutch performance as an isolated performance episode). Where possible, the more specific terminology of either clutch ability or clutch episodes will be used.

Table 2.2*Definitions of Clutch in the Included Studies*

ID	Definitions
1	Situation: “For clutch, I used the Elias ‘Late Inning Pressure’ definition – seventh inning or later, tied or down by 3 runs or less, unless bases are loaded, in which case down by 4 runs was included” (p. 75)
2	No explicit definition provided
3	Situation: “the best clutch hitter as the man whose total batting average improved the most in late-inning pressure situations. (A late inning pressure situation is one occurring in the seventh inning or later, with the batter's team either tied to trailing by three runs or less, four runs if the bases are loaded)” (p. 1)
4	No explicit definition provided
5	No explicit definition provided
6	Ability: “batters whose performance in critical game situations consistently exceeds expectations, as established by both that batter's performance in less critical situations and also by the relative performance of average batters in critical game situations” (p. 85); “clutchness, a possible tendency for a hitter to be more effective in critical game situations” (p. 86)
7	Ability: “clutch pitchers: men who won significantly more games than expected because of some unusual ability to pitch to the score and emerge victorious in the close games” (p.124)
8	No explicit definition provided
9	Performance: “Superior performance that occurs under pressure circumstances (Otten, 2009)” (p. 392)
10	Ability: “The clutch-player effect argues performance increases when stakes are higher” (p. 97)
11	Situation: “instances of high pressure (or in ‘clutch’ situations)” (p. 144)
12	Performance: “we define a clutch performance here as any performance increment or superior performance that occurs under pressure circumstances” (p. 584)
13	Performance: [in reference to choking] “Otten (2009) proposed that a ‘clutch’ performance is a similar performance increment under pressure” (p. 532)
14	Situation: “a clutch situation as an at-bat with runners in a scoring position” (p. 29)
15	Performance: “The term ‘clutch’ is commonly used to describe any performance increment or superior performance, relatively better than usual standards, that occurs under pressure circumstances (Albert, 2007; Otten, 2009). It often refers to high levels of performance in a critical situation, typically that of a game-deciding shot or the final few minutes in a close/tied match” (p. 130)
16	No explicit definition provided
17	No explicit definition provided
18	Performance: “Otten's (2009) definition was adopted (i.e., ‘any superior performance under pressure’...)” (p. 525)

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- 19 **Performance:** “defined (at the start of the recruitment process) as a superior performance under pressure (Otten, 2009)” (p. 143)
- 20 **Performance:** [in reference to performing under pressure] “adaptive (e.g., ‘clutch’) responses” (p. 1)
- 21 **Performance:** “clutch response has been defined as ‘any performance increment or superior performance that occurs under pressure circumstances’ (Otten, 2009, p. 584). Moreover, a clutch performance occurs when an athlete succeeds during a pressure situation, is aware that the performance occurs during a pressure situation, has the capacity to experience stress, perceives the outcome of the competition as important and succeeds largely through effort (Hibbs, 2010). Therefore, clutch performance is about above-average performance in a competitive pressure situation, during which the athlete is aware of the pressure” (p. 2273)
- 22 **Performance:** “clutch performance has been defined as ‘any performance increment or superior performance that occurs under pressure circumstances’ (Otten, 2009, p. 584). Importantly, Hibbs (2010) proposed that the athlete must be aware of that pressure, have the capacity to experience stress, perceive the outcome of the competition as important, and succeed largely through effort” (p. 378)
- 23 **Performance:** “refers to improved performance under pressure (Otten, 2009)” (p. 88)
Psychological State: “clutch states therefore appear to underlie such instances of superior performance under pressure (Otten, 2009), with Hibbs (2010) denoting that the athlete must be aware of that pressure; have the capacity to experience stress; must perceive the outcome to be important; and must succeed largely through effort” (p. 88)
- 24 **Performance:** “defined as ‘any performance increment or superior performance that occurs under pressure circumstances’ (Otten, 2009, p. 584). Furthermore, clutch performance represents instances when competitive athletes are successful in pressured situations, are cognisant of the pressure attached to the situation, possess a capacity to experience stress, understand the importance of the outcome and achieve their success through skilled actions (Hibbs, 2010)” (p. 114)
Psychological State: “clutch states refer to the subjective experience underlying clutch performance (Swann et al., 2017a)” (p. 114)
- 25 **Performance:** “defined as ‘any performance increment or superior performance that occurs under pressure circumstances’ (Otten, 2009, p. 584), and is considered to occur when an athlete is successful in a challenging and important situation, is aware of the situation’s importance, can experience task-related stress, is concerned with the performance outcomes, and thrives through skill rather than good fortune (Hibbs, 2010)” (in press)
- 26 **Ability:** “a clutch athlete exhibits superior performance under pressure (Otten, 2009)” (p. 4)
- 27 **Performance:** “when an athlete is aware that they are performing in a challenging situation, cares about the outcome, has the capacity to experience stress about that situation, and succeeds primarily due to skill (see Hibbs, 2010 for full definition and conceptual analysis)” (p. 111)
-

2.3.5 Theoretical Frameworks and Clutch Performance

Table 2.1 provides an overview of the theoretical frameworks and conceptual models within the included studies. From the included studies, 33% ($n = 9$) provided no explicit theoretical framework for clutch performance. These studies may therefore be considered atheoretical. The following section discusses the different theoretical frameworks that were employed in the remaining studies.

2.3.5.1 Choking-Based Explanations

Eleven studies examined clutch performance in relation to choking. Primarily, these studies drew on attentional theories ($n = 8$), which included self-focus theories ($n = 5$), distraction theories ($n = 1$), or both self-focus and distraction theories ($n = 2$). Of note, the majority ($n = 5$) of studies utilising attentional theories employed definitions that called for increased performance (e.g., Otten, 2009). No explanation was provided, however, for how such theories accounted for increased performance (i.e., only the proposed mechanisms behind performance breakdown were described). One study (Worthy et al., 2009), meanwhile, drew on regulatory focus theory. This theory explains that athletes are more likely experience performance decrements when trying to avoid losing the game, as opposed to trying to win the game. Lastly, Hill and Hemmings (2015) and Hill et al. (2017) examined the self-presentation model. The self-presentation model is concerned with understanding how one's self-presentation motives affect their performance anxiety, which may then precede attentional breakdowns via self-focus or distraction.

2.3.5.2 Integrated Model of Flow and Clutch States

Six studies (Jackman et al., 2017, 2020; Swann et al., 2016, 2017a, 2017b, 2019) positioned clutch states within the Integrated Model of Flow and Clutch States. This model outlines the performance contexts, process of occurrence (discussed further

below), subjective experience, and outcomes of clutch states. Hence, this model focuses on explaining the psychological state underlying clutch performance, rather than clutch performance per se (see *Inadequate Theoretical Framework* for further discussion).

2.3.5.3 Neoclassical Economic Theory

One study (Cao et al., 2011) stated that “neoclassical economic theory predicts that individuals exert the most effort, and consequently produce their best performances, when the returns to effort are highest” (p. 231). Little further information, however, was provided about this theory, and how the results may or may not support it.

2.3.6 Measurement of Clutch Performance

No established measure of clutch performance was utilised in the included studies. Accordingly, this section reviews approaches to measurement with respect to the two essential constructs of clutch performance (i.e., those constructs that are core across definitions of clutch performance): (i) performance; and, (ii) pressure.

2.3.6.1 Measuring Performance

Naturally, performance is inherent in the study of clutch performance. The following section addresses approaches to measurement of performance in studies examining clutch ability, and in studies examining clutch episodes.

2.3.6.1.1 Clutch Ability. Table 2.3 presents the ways in which performance was assessed in the included studies. Objective measures of performance were employed in the majority of studies assessing clutch ability ($n = 13$; 94%). These studies all examined archival, naturalistic performance data. The benchmarks against which performance was assessed ranged considerably, however, and included comparing performance against: career averages (Cao et al., 2011); previous season performance (e.g., Birnbaum, 2008); performance within the same season (e.g., Birnbaum, 2009); and, performance within the same game (e.g., Wallace et al., 2013). In one study

performance was assessed against an athlete's projected performance (i.e., clutch ability was judged against performances that had not yet occurred; Deane & Palmer, 2006).

Across all of these studies, performance was considered to have improved if there was a statistically significant increase compared to the respective performance benchmark (e.g., one's career average; Cao et al., 2011). Subjective measurement of performance, meanwhile, was adopted in one mixed methods study (Owens et al., 2016). In this study, performance was assessed by asking a coach to evaluate which players in their team consistently performed well, or did not perform well, under pressure.

Table 2.3

Measurement of Performance

Design	Measurement of Performance	Analysis	Studies	
			Sport-specific skill performance ^a	Global sport performance ^b
Clutch ability	Objective	Archival	Relative to previous season performance	1, 3, 5
			Relative to same season performance	2, 13
		Relative to projected performance	7	
		Relative to career average performance	4, 17	
		Relative to same game performance	16	
		Relative to same game performance and teammates same game performance	15	
	Subjective	Coach-reported	26	
Clutch episodes	Objective	Mixed methods	Observation – relative to tournament performance	27
			Experimental	Relative to baseline performance
	Subjective	Self-reported		18, 19, 20, 21, 22, 23, 24, 25, 27

^a refers to specific skills within sports, specifically golf-putting and basketball free throw shooting; ^b refers to general sport performance

2.3.6.1.2 Clutch Episodes. As displayed in Table 2.3, studies in which clutch performance was assessed as an isolated episode primarily measured performance using subjective methods ($n = 8$; 62%). Generally, measurement involved participant self-

report through semi-structured interviews, which principally reported athletes' and exercisers' perceptions of their own performance.

All experimental studies utilised objective measures of performance ($n = 4$; 31%). Performance was assessed following pressure manipulation in a sport-specific task (i.e., golf-putting, $n = 3$; basketball free-throw shooting, $n = 1$), and then compared with baseline scores. In three studies (Gray et al., 2013; Otten, 2009; McEwan et al., 2012), performance improvement following pressure manipulation was considered clutch performance. As in the archival designs, performance was considered to have improved if there was a statistically significant increase compared to baseline performance. One study (Gray & Cañal-Bruland, 2015) meanwhile, considered clutch performance to be evident in those participants who did not choke. Accordingly, the clutch performance group in this study still decreased performance relative to baseline, but to a significantly lesser degree than those who choked. This suggests confusion around the extent of the performance increment required to classify a clutch performance.

One study (Swann et al., 2016) utilised both objective and subjective measures of performance. Specifically, this study involved observations of professional golfers during the final rounds of tournaments, a performance monitoring tool to objectively “indicate peaks and troughs in the player’s performance” (p. 104), and then event-focused interviews about the same rounds as soon as possible afterwards. To date, this appears to be the only study that has combined both objective and subjective measurement of performance.

2.3.6.2 Measuring Pressure

The construct of pressure is central to definitions of clutch performance. Pressure is “the presence of situational incentives for optimal, maximal, or superior

performance” (Baumeister & Showers, 1986, p. 362), and importantly, involves a subjective component. The following sections review approaches to measurement of pressure in studies investigating clutch ability, and studies investigating clutch episodes.

2.3.6.2.1 Clutch Ability. Table 2.4 provides an overview of the methods used to measure pressure in the included studies. The majority of studies ($n = 13$; 94%) designed to measure clutch ability did not directly measure pressure. Instead, as a proxy measure, certain in-game situations were used to represent pressure. Across these 13 studies, eight different situations were specified to infer pressure (see Table 2.4). Generally, these were situations considered important to the overall outcome of the game or tournament, although there was some inconsistency. For example, Solomonov et al. (2015) considered pressure in the NBA as the last five minutes in games within a score differential of 5-points, in the last 20 games of the regular season. Worthy et al. (2009), meanwhile, considered pressure as the last five minutes in games within a score differential of 6-points, in NBA playoff games. Taken together, the decisions to determine what situations and factors represent pressure seem rather inconsistent and arbitrary. Indeed, only one study (Otten & Barrett, 2013) provided supporting justification that the assessed situation – MLB playoff games – was likely to increase an athletes’ pressure. Specifically, Otten and Barrett (2013) noted that greater fan attendance, media attention, and internal and external rewards were likely to increase traditional forms of pressure (e.g., presence of audience, ego relevance, reward contingency; Baumeister & Showers, 1986).

The remaining study that examined clutch ability utilised a mixed-methods design. Owens et al. (2016) conducted a single coach interview, which involved the coach identifying which players performed well under pressure. In addition, Owens et al. (2016) also distributed a ProScan Survey (Professional Dynamic Programs, 2003) to

athletes, who were instructed to reflect on how they expect to perform under pressure. The ProScan Survey has been validated as a measure of personality (Hubby & Williamson, 1988), though not as a measure of pressure. In summary, it is difficult to discern the extent to which the operationalisation and measurement of pressure was valid across studies examining clutch ability.

Table 2.4

Measurement of Pressure

Design	Direct Measurement of Pressure?	Methods	Measurement	Studies
Clutch ability				
	NO	Proxy/Secondary	Operationalisation	
			Probabilistic importance ^a	5, 6
			LIP situation ^b	1, 3
			Personal goal ^c	2
			With runners in scoring position ^d	14
			Context of tournament or game	10, 13
			Time remaining and score differential	4
			Context of game and time remaining	16
			Context of game, time remaining, and score differential	15, 17
		No explicit operationalisation of pressure situation		7
	YES			
		Self-report (quant.)	ProScan Survey	26
		Coach-report (qual.)	Interview with coach	26
Clutch episodes				
	YES			
		Self-report (qual. and mixed methods)	Interviews	18-25, 27
			Anecdotal ^e	11
		Self-report (quant.)	Immediate Anxiety Measures Scale (IAMS)	8, 9
			Competitive State Anxiety Inventory-2 (Revised) (CSAI-2R)	12
		Physiological	Heart rate	8

^a includes formulas which account for the importance of certain match points on the overall outcome of the match, where more important points represent higher pressure, and more heavily weighed; ^b LIP situation is defined as "seventh inning or later, tied or down by 3 runs or less, unless the bases are loaded, in which case down by 4 runs is included"; ^c going for a 20th win when pitching in baseball; ^d when batting in baseball and runners are in a position to score; ^e researchers asked participants how much pressure they felt after the experiment, but this was not analysed or reported

2.3.6.2.2 Clutch Episodes. Studies designed to examine clutch episodes used a range of methods and tools to measure pressure (see Table 2.4). Qualitative and mixed methods approaches predominantly involved interviewing athletes and exercisers ($n = 9$). Interview methods allow for rich and detailed descriptions of subjective experiences (Smith & Sparkes, 2019), and hence, could offer a valuable avenue for in-depth explorations of pressure.

Experimental studies ($n = 4$) primarily employed psychometric measures of anxiety to examine pressure. Gray et al. (2013) asked participants to respond to the Immediate Anxiety Measures Scale (IAMS; Thomas et al., 2002). Similarly, Gray and Cañal-Bruland (2015) used the cognitive and somatic anxiety items of the IAMS, which has been identified as a valid and reliable measure of anxiety (Thomas et al., 2002), whilst also assessing changes in participants' average heart rate between trials. Meanwhile, Otten (2009) employed the Competitive State Anxiety Inventory 2 (Revised) (CSAI-2R; Cox et al., 2003), which is also a validated measure of anxiety (Cox et al., 2003). Whilst anxiety has been identified as an indicator of pressure (e.g., Gucciardi & Dimmock, 2008), measures of anxiety do not directly measure perceptions of pressure (Kent et al., 2018). As such, it is arguably the case that these experimental studies did not actually measure pressure, but examined a single, negatively framed (e.g., Burton & Naylor, 1997), indicator of pressure. Lastly, McEwan et al. (2012) asked participants "how much pressure and anxiety they felt throughout the experiment" (p. 145). Responses to this question, however, did not undergo formal qualitative analysis, and accordingly were not reported in the results. Hence, the validity of this pressure manipulation is unclear.

2.3.7 Evidence for Clutch Performance

Evidence for clutch performance as an observable phenomenon was mixed. This section reviews the evidence for clutch performance with respect to studies that examined clutch ability, and studies that examined clutch episodes.

2.3.7.1 *Clutch Ability*

Ten studies explicitly investigated the existence of clutch ability in sport⁶. From these studies, eight did not provide support for the existence of clutch ability. In studies examining baseball, fluctuations in performance during pressure situations were demonstrated to be more likely a product of random variation (Brooks, 1989; Cramer & Palmer, 2008; Deane & Palmer, 2006; Ruane, 2005), general hitting quantity (Cramer, 1977), or in the case of pitching, other performance factors (e.g., run support; Birnbaum, 2009). Further, clutch performance in one season was not predictive of clutch performance in future seasons (Birnbaum, 2008). In basketball, meanwhile, Wallace et al. (2013) demonstrated that most players were statistically average during the 4th quarter of NBA playoff games when compared with the previous 3 quarters of the same game, indicating no evidence of clutch ability.

In contrast, Jetter and Walker (2015) demonstrated support for the existence of clutch ability in tennis. Higher ranked players were more likely to win a Grand Slam tournament relative to other events, and also more likely to perform well in clutch situations within the match (e.g., tie-breaks). Furthermore, Solomonov et al. (2015) showed that “clutch players’ performance generally improves in the sense that they exert more effort in the final, critical moments of the game” (p. 136). Metrics such as foul drawing, free throw attempts, and successful free throws significantly increased

⁶ Not all studies designed to examine clutch ability explicitly investigated whether the concept existed. Rather, four studies (Ottens & Barrett, 2013; Cao et al., 2011; Owens et al., 2016; Worthy et al., 2013) assumed *a priori* that clutch performance, or clutch ability, existed.

compared to earlier periods in the game. These findings raise questions as to what aspects of performance must increase to be considered a clutch performance. For example, is increased effort, or specific components of performance – such as fouls drawn – sufficient, or is a more global perspective of performance outcomes necessary for clutch performance? In summary, there was limited support for the existence of clutch performance when examined as an ability. The measurement limitations of these studies, however, should be considered when assessing the validity of this conclusion. Specifically, it is unclear to what extent pressure was experienced by athletes in these studies, and the performance benchmarks used to assess performance were inconsistent.

2.3.7.2 Clutch Episodes

In contrast to studies examining clutch ability, studies investigating isolated clutch episodes demonstrated strong support for the existence of clutch performance. Experimental studies generally indicated that participants could increase performance in response to pressure manipulations (Gray et al., 2013; Otten, 2009; McEwan, 2012). Qualitative studies showed that athletes could recall having clutch performances (Hill et al., 2017; Hill & Hemmings, 2015; Maher et al., 2018), whilst at the experiential level, clutch states – the subjective experience of clutch performance – were reported to occur during excellent sport performances and rewarding exercise experiences (e.g., Jackman et al., 2017). Specifically, clutch states were proposed to consist of 12 characteristics: absence of negative thoughts; absorption; altered sensory perceptions; automaticity of skills; confidence; deliberate focus; enhanced motivation; enjoyment; heightened arousal; heightened awareness; intense effort; and perceived control (Jackman et al., 2017, 2020; Swann et al., 2016, 2017a, 2017b, 2019). In summary, support for clutch performance both as a performance outcome, (e.g., Gray et al., 2013) and at an

experiential level (e.g., Swann et al., 2017a), was demonstrated in studies examining clutch episodes.

2.3.8 Occurrence of Clutch Performance

This section reviews factors involved in the occurrence of clutch performances. Given that limited supporting evidence was found for clutch ability, this section focuses solely on the occurrence of clutch episodes.

2.3.8.1 Clutch Episodes

From experimental studies, a range of factors were identified in the occurrence of clutch performance. Gray et al. (2013) demonstrated that in golf putting, participants who increased performance under pressure had improved putting kinematics (i.e., swing amplitude) compared to baseline performance. McEwan et al. (2012), meanwhile, showed that participants who warmed up under high-pressure conditions performed significantly better in a single-shot, golf-putting task than those who warmed up under low-pressure conditions. Lastly, Otten (2009) indicated that a sense of perceived control during a free-throw task was the strongest predictor of clutch performance. The factors identified in the occurrence of clutch performance, therefore, varied considerably across experimental designs, and included technique improvements, warm-up strategies, and psychological mechanisms.

The occurrence of clutch performance episodes was also investigated in qualitative designs. Hill and Hemmings (2015) reported a number of approach coping strategies to facilitate clutch performance, such as simulated practice, performance routines, and cognitive restructuring (e.g., re-appraising threatening stressors as a challenge). The roles of simulated practice and performance routines in the occurrence of clutch performance were also highlighted by Maher et al. (2018) and Hill et al. (2017), in addition to a range of other factors. For example, Hill et al. (2017) reported

that a sense of perceived control and challenge appraisal were also involved in the occurrence of clutch performances. Collectively, factors that consistently emerged out of these qualitative studies were challenge appraisal, simulated practice, and performance routines.

Four studies reported the occurrence of clutch states as a series of steps (Swann et al., 2016, 2017b, 2019; Jackman et al., 2020). Clutch states occurred in contexts characterised by importance, and when the participant was still in contention to achieve an important goal. Athletes and exercisers initially appraised the situation as a challenge before setting specific goals relating to the desired outcome of that situation. Athletes and exercisers then made a deliberate decision to “step up” their effort and intensity in order to try and achieve those goals (Swann et al., 2019, p. 92). In addition, Jackman et al. (2020) reported that the occurrence of clutch states occur may be related to an athlete’s mental toughness. Specifically, athletes high in mental toughness reported a more rapid initiation of clutch states than athletes low in mental toughness, particularly when in response to setbacks. Whilst processes of occurrence for clutch states has been consistently reported (Swann et al., 2016, 2017b, 2019; Jackman et al., 2020), questions remain over the relationship between clutch states and clutch performance (i.e., do clutch states always underlie clutch performances?).

2.4 Discussion and Recommendations

The aim of this review was to synthesise and evaluate existing research on clutch performance in sport and exercise. The findings indicated that research into clutch performance has gathered momentum in the last decade. Over 75% ($n = 21$) of the included studies were published since 2009, with a third ($n = 9$) published since 2016. This momentum suggests that clutch performance is a contemporary field of research in sport and exercise psychology (e.g., Perry, 2019). Findings from this review,

however, also suggest there is significant definitional, conceptual, and measurement heterogeneity within the field. Clutch performance has been defined inconsistently, with definitions referring to this construct both as an ability and an individual performance, whilst studies have also employed definitions of clutch situations and clutch states. Accordingly, two major approaches are evident in the field, which conceptualise clutch performance as an: (i) ability; and (ii) individual performance episode. These differing approaches have resulted in disparate measurement of clutch performance with questionable validity, and consequently, conflicting evidence regarding the existence of clutch performance.

2.4.1 Assessing Evidence for Clutch Performance

Studies which explicitly investigated the existence of clutch ability ($n = 10$) demonstrated limited support. As Hibbs (2010) noted, however, “in order to assign clutch ability to a competitor, one must first know what a clutch performance is” (p. 48). At present, definitions of clutch performance lack specificity and clarity (see *Definitional Issues*), and consequently, it is difficult to determine exactly what clutch ability is. Moreover, studies examining the existence of clutch ability relied on proxy measures of pressure (i.e., certain game situations were used to infer pressure), meaning that the extent to which these athletes experienced pressure is unclear. Against this backdrop of definitional and measurement issues, making any conclusions about the existence of clutch ability based on current literature seems somewhat premature.

In contrast, support for isolated episodes of clutch performance was demonstrated across qualitative, experimental, and mixed methods designs. These studies identified a variety of factors in the occurrence of clutch performance. For example, technique improvements (e.g., Gray et al., 2013), simulated practice and performance routines (e.g., Maher et al., 2018), and psychological processes (e.g.,

perceived control; Otten, 2009) were all identified in the occurrence of clutch performance. In addition, Swann et al. (2016, 2017b, 2019) and Jackman et al. (2020) highlighted a sequential process in the occurrence of clutch states. Whilst these studies provide evidence for isolated episodes of clutch performance, they also highlight inconsistencies in how the occurrence of clutch performance has been examined, ranging from exploration of distal factors (e.g., simulated practice; Maher et al., 2018) to more proximal factors (e.g., perceived control; Otten, 2009). This perhaps suggests that even within studies adopting a similar approach (i.e., clutch episodes), there remains some confusion over how to examine the occurrence of clutch performance.

2.4.2 Definitional Issues

Definitions are important in facilitating conceptual clarity, informing measurement, and determining the direction of future research (Cooper et al., 2001; Wacker, 2004). This review demonstrated that 26% ($n = 7$) of studies did not provide a definition of clutch, in any sense. When definitions were provided, these extended beyond defining clutch performance, and were also provided in terms of an ability (i.e., the ability to produce repeated, increased performances during critical game situations; Deane & Palmer, 2006), a situation (i.e., performance situation which is high in pressure; McEwan et al., 2012), and as a psychological state (i.e., the subjective experience underlying clutch performance; Swann et al., 2019). These varied definitions suggest conceptual confusion surrounding what clutch performance is, and is not. The most common definitions of clutch performance, meanwhile, were applied inconsistently. Otten's (2009) definition of clutch performance was cited both in studies that examined clutch performance as an ability (e.g., Solomonov et al., 2015), and as an individual episode (e.g., Hill et al., 2017). Further, five studies supplemented Otten's (2009) definition with Hibbs' (2010) definition of clutch performance, despite there

being meaningful differences between the two (see *Guiding Principles for Clutch Performance Research*). Hence, a key finding from this review is that current definitions of clutch performance have not facilitated conceptual clarity and, accordingly, may require refinement to clearly differentiate between clutch ability and clutch performance episodes.

2.4.3 Inadequate Theoretical Framework

Robust theory represents a fundamental aim of science, providing the foundation upon which research and practice should be built (Cunningham, 2013; Doherty, 2013). The present review indicated that current theoretical approaches to clutch performance are insufficient. The most popular approach ($n = 11$) within the included studies was to employ theories (i.e., attentional theories) and models (i.e., self-presentation model) that primarily focused on explaining the mechanisms underlying performance breakdown. Both attentional theories and the self-presentation model, however, are grounded in performance responses to anxiety. Whilst anxiety is an indicator of pressure (e.g., Gucciardi & Dimmock, 2008), it has not been demonstrated that experiencing pressure always results in anxiety. Indeed, Baumeister and Shower's (1986) formative, and widely used (e.g., Low et al., 2020), definition of pressure is relatively neutral (i.e., "the presence of situational incentives for optimal, maximal, or superior performance", p. 362). As such, it may not be the case that all clutch performances are preceded by symptoms of anxiety or occur in a state of anxiety. Therefore, based on current understandings of clutch performance, attentional theories and the self-presentation model do not account for the range of potential responses to pressure that may lead to clutch performance.

The Integrated Model of Flow and Clutch States (Swann et al., 2017b, 2019) was employed in six studies, and describes the occurrence and experience of clutch

states. Whilst this model emerged from a primarily qualitative methodology based on inductive analysis, and is to undergo harsher tests (e.g., experimental designs), it does outline a process of occurrence for clutch states. Importantly, these predictions can be tested and, if unsupported, falsified. It remains unclear, however, if clutch states are inherent to clutch performance, and vice versa. As with attentional theories and the self-presentation model, the Integrated Model of Flow and Clutch States (Swann et al., 2017b, 2019) only provides a partial explanation of clutch performance (i.e., based on clutch states). Lastly, a third of the included studies ($n = 9$) employed no theoretical framework for clutch performance. This both limits the utility of these studies (i.e., cannot adequately explain and predict phenomena; Bacharach, 1989), and highlights that a notable quantity of clutch performance research has been atheoretical. In summary, current theories and conceptual models do not offer complete explanations of clutch performance. Future research, therefore, needs to work towards development of a specific theory of clutch performance.

2.4.4 Methodological Critique

Broadly defined constructs lacking in specificity and clarity may result in disparate measurement (Wacker, 2004). The impact of unclear definitions of clutch performance is evident in the extent to which measurement has been approached inconsistently. Clutch performance was examined as an ability in just over half of the included studies, which primarily involved utilising archival designs. Measurement of performance in archival designs ranged from comparing performance within the same game (e.g., Wallace et al., 2013) to comparing performance with a career average (e.g., Cao et al., 2011), highlighting the unclear nature of what benchmark clutch performance should be compared against. Further, archival studies did not directly measure pressure. Instead, pressure was treated as a categorical variable that was inferred from the

performance situation (i.e., it was assumed all athletes experienced the same amount of pressure in certain situations, such as all games within a Grand Slam tournament; Jetter & Walker, 2015). Indeed, only one study (Otten & Barrett, 2013) justified why the performance situation (i.e., MLB playoffs) inferred pressure. This general lack of measuring pressure is problematic as pressure involves a subjective component (Baumeister & Showers, 1986) and, therefore, it cannot be assumed that all athletes will perceive these situations in the same way.

The impact of unclear definitions was also evident in experimental studies that examined clutch performance as an isolated episode. For example, different performance thresholds were used to categorise clutch performances between experiments (e.g., Gray & Cañal-Bruland, 2015). This suggests a need for consensus over the performance level required for clutch performance (i.e., increased or maintained performance). Furthermore, the use of psychometric measures of anxiety to assess pressure is incomplete. Whilst measurement of anxiety may indicate the intensity of cognitive and somatic anxiety, this provides little information regarding how, or if, pressure is interpreted facilitatively. Indeed, it is not clear whether the perception of pressure necessarily results in increased anxiety. Accordingly, more complete measurement of pressure is important, especially when considering questions have been raised about the capability of experimental designs to replicate the demands of naturalistic pressure situations (Gucciardi & Dimmock, 2008; Jackson, 2013).

From the included studies, qualitative and mixed method approaches represent the most appropriate measure of pressure at present. This is because interviews allow an in-depth exploration of pressure following real-world episodes of clutch performance. These interview methods, however, differed in their methodological strength. Specifically, three studies (Hill & Hemmings, 2015; Hill et al., 2017; Maher et al.,

2018) employed career-based interviews, which ask athletes to report on events that occurred months or years in the past (Swann et al., 2018). In contrast, event-focused interviews aim to interview athletes within hours or days of a performance and have been suggested as a methodologically stronger alternative (Swann et al., 2018). This is because event-focused interviews may reduce the risk of athletes' forgetting details or presenting a biased recall (Brewer et al., 1991; Yarrow et al., 1970). Accordingly, studies that employ single event-focused interviews (Jackman et al., 2020; Swann et al., 2016, 2017b, 2017a, 2019) may offer the most detailed and accurate qualitative account of episodes of clutch performance. Studies that adopted repeat event-focused interviews with the same individual (e.g., Jackman et al., 2017), meanwhile, can provide insight into the consistent features underlying clutch performance, and how these features may develop or diminish over time.

2.4.5 Guiding Principles for Clutch Performance Research

Findings from the current review indicate that there are significant definitional, theoretical, and measurement issues within the field of clutch performance. These issues centre on a lack of consensus surrounding what clutch performance is, and what it is not. As a starting point in addressing these problems, we outline a number of recommendations in an effort to facilitate greater conceptual clarity. Specifically, we draw on the findings of this review to propose a number of guiding principles for future research on clutch performance.

First, clutch performance inherently requires pressure, which means that clutch performance is a psychological construct. Pressure involves the presence of situational incentives for optimal performance, and crucially, involves a subjective component (i.e., the situation is internally appraised as important; Baumeister, 1984). Accordingly, clutch performance cannot solely be measured as a behavioural outcome (such as runs

scored; Deane & Palmer, 2006), as this method cannot account for subjective appraisal of situational importance. Measurement of pressure, therefore, is required when examining clutch performance, and future research should investigate if, and through what mechanisms, pressure may lead to increased performance.

Second, clutch performance is an isolated episode of performance – not an ability. Baumeister and Showers (1986) noted that “pressure by definition focuses on a single, present performance” (p. 362). As discussed above, pressure is a requirement of clutch performance, and hence clutch performance must be an isolated episode. Further, the current review showed strong support for clutch performance as an isolated performance episode, whilst evidence for clutch performance as an ability was limited. Indeed, any examination of clutch ability inherently relies on first understanding singular episodes of clutch performance (Hibbs, 2010). Accordingly, research should examine clutch performance as an isolated performance episode, with a focus on understanding the requirements and boundaries of such an episode, before investigating the notion of clutch ability.

Third, *positive* performance is required for clutch performance. Otten (2009) defines clutch performance as “increased or superior performance” (p. 582), whilst Hibbs (2010) specifies a “successful performance” (p. 49). Whilst the current review demonstrated support for both of these positions (Gray et al., 2013; Swann et al., 2017b), several questions remain. For example, when considering increased or superior performance, it is unclear what magnitude performance needs to increase by, and what benchmark the performance is compared against. It is also unclear as to what is required to constitute performance (e.g., is increased effort, or particular components of performance, sufficient?). Using successful performance, meanwhile, raises concerns over the extent to which clutch performance conceptually overlaps with constructs such

as coping and choking-resistance (Kaiseler et al., 2009; Mesagno & Marchant, 2013). Therefore, at this stage, it is difficult to recommend the position of either Otten (2009) or Hibbs (2010). Accordingly, we recommend that researchers investigate *positive* performance under pressure. The intentions behind proposing the term *positive* are twofold. Firstly, it acts as an umbrella term that encapsulates both increased, and successful, performance. Secondly, investigating a broad range of performances is important in bringing clarity to the questions raised above. For example, one line of inquiry for future research may be examining what performance thresholds athletes and exercisers utilise to evaluate their own performance under pressure. As such, this principle is proposed with the intention to be tested, challenged, and refined through future research.

Last, the role of perceived (i.e., positively appraised) performance should be considered when evaluating clutch performance. The current review included a significant body of literature that primarily reported on perceived performance (e.g., Swann et al., 2019), in addition to studies that examined objective performance (e.g., Gray et al., 2013). Indeed, neither Otten's (2009) nor Hibbs' (2010) definitions specify a distinction between perceived or objective performance. As such, it is recommended future research examines both objective and positively appraised performance. This principle should be adopted with an emphasis on understanding how athletes and exercisers judge their own performance. That is, do athletes and exercisers primarily rely on objective performance or perceived performance, or a combination of both, when evaluating their own performance under pressure.

The four guiding principles outlined above are provided as a tentative solution (Popper, 1981), and accordingly, are open to refutation. Indeed, these recommendations are proposed with the aim to stimulate further debate around what constitutes clutch

performance and help guide future research. In summary, we recommend that researchers and practitioners be critical in adopting existing definitions of clutch performance and aim to develop a refined definition and theory of clutch performance.

2.4.6 Strengths and Limitations

The systematic nature of the review was a strength. Efforts were taken to ensure transparency, limit author bias, and improve trustworthiness. Despite these strengths, there are also several limitations of the current review that are important to note. Firstly, this review excluded studies that were not in English or not in a peer reviewed journal, which may have created a language and publication bias. Secondly, the focus on participants in sports and exercise meant that related performance domains that may have investigated clutch performance were excluded. Third, to ensure that clutch was a primary focus of the study, the term clutch was only searched for in the title, abstract, and keyword field. Indeed, this may partly explain the relatively low return of 27 studies that were included in the present review, despite facilitation of performance under pressure being a fundamental aim of sport and exercise psychology. We recognise that studies in overlapping fields may not use the terminology of clutch performance, but rather more generic terminology (e.g., performance under pressure). However, to avoid the confounding of multiple concepts, and to limit the amount of irrelevant studies in the screening process, the focus of the present review was solely on the concept of clutch performance. Whilst the limitations of this review are recognised, at all stages steps were taken to limit these, whilst some were also inherent to the nature of the review question (e.g., a focus on sport and exercise).

2.4.7 Conclusion

The concept of clutch performance has experienced a substantial increase in research attention and activity over the last decade. This review demonstrated, however,

that there are significant definitional, conceptual, and measurement issues within the field. Specifically, there appears to be a lack of clarity regarding what clutch performance is, and what clutch performance is not. In response, four guiding principles were provided as a tentative solution (Popper, 1981). In putting forth these principles, we seek to open debate around the concept of clutch performance in an effort to move the field forward. Indeed, definitional and conceptual refinement is essential to facilitate appropriate measurement of clutch performance, and in turn, move the field closer to its' overarching aim: to help individuals perform positively under pressure.

Chapter 3: Exploring the “Clutch” in Clutch Performance: A Qualitative Investigation of the Experience of Pressure in Successful Performance

3.1 Foreword

Results from Chapter 2 (Study 1; Schweickle et al., 2020) indicated that there was significant definitional, conceptual, and measurement heterogeneity within the field of clutch performance. To further develop the construct of clutch performance, key recommendations provided in Chapter 2 were to examine when, and under what circumstances, clutch performances may occur, and further, how pressure may lead to clutch performances. Accordingly, the aim of the following Chapter (Study 2) was to explore athletes’ perceptions of the “clutch” in clutch performance (i.e., athletes’ perceptions of pressure), and how this perception influenced their performance.

There are, however, several important methodological and terminological considerations to highlight in moving from Chapter 2 (Study 1) to the empirical phase of the current thesis (i.e., Chapters 3, 4, and 5). Firstly, whilst Chapter 2 included a review of clutch performance research in both sport and exercise, the proceeding empirical Chapters (i.e., 3, 4, and 5) examined clutch performance exclusively within the context of sport. This decision stemmed from the results provided in Chapter 2, which demonstrated significant conceptual heterogeneity within the field of clutch performance. Accordingly, it was deemed important to draw from participants within a similar context (e.g., Maxwell, 2012), in an effort to reduce conceptual heterogeneity. Second, the following empirical Chapters (i.e., 3, 4, and 5) adopted a qualitative or mixed-methods approach. Specifically, event-focused interviews (Jackman et al., 2021) were utilised in all studies, in line with the recommendations provided in Chapter 2 that qualitative and mixed-methods approaches offered the most robust measurement of the experience of pressure. Lastly, within Chapter 2 the terminology *clutch performance*

was used to refer to both clutch episodes and clutch ability. It was recommended within Chapter 2, however, that clutch performance research should focus on understanding individual clutch episodes before investigating the construct of clutch ability. As such, all proceeding studies only examined clutch episodes, and hence, the terminology of *clutch performance* was used to refer to clutch episodes, unless otherwise specified.

Institutional ethics approval, participant information sheets and consent forms for the empirical phase of the thesis (Chapters 3, 4, and 5) are provided in Appendices F, G, and H, respectively. The following research (excluding abstract and reference list) has been published in the *Psychology of Sport and Exercise* (Schweickle et al., 2021) and reformatted for the thesis.

3.2 Introduction

The phenomena of clutch performance refers to an athlete performing optimally or successfully under pressure circumstances (Hibbs, 2010; Otten, 2009; Otten, 2013). Historically, this concept emerged from the notion of performing “in the clutch” (Safire, 2005), a colloquial term often used to describe important or crucial situations in sport⁷ (Merriam-Webster, 2020). Traditionally, research has mirrored this colloquial use by investigating performances that occur during a range of “clutch situations” in sport, such as: when the game score is close with limited time remaining (e.g., Cao et al., 2011); during playoffs or important tournaments (e.g., Jetter & Walker, 2015); or, when in position to make a scoring play (e.g., Ruane, 2005). A number of recent qualitative studies, however, have highlighted that athletes’ may also perceive importance, and experience increased pressure, outside of these traditional clutch situations (e.g., during training; Swann et al., 2017a). As such, the clutch has both been treated as an objective

⁷ The term clutch may also be used in the adjective form, in that an athlete may “be clutch”, which refers to successful performance during these situations. However, throughout the manuscript, the use of “the clutch” refers to the circumstances or situations in which a clutch performance may occur.

situation (i.e., finals) and a subjective appraisal (i.e., any increased appraisal of pressure). This dichotomy in approaches has not only resulted in confusion over when clutch performances occur, but also how such performances occur. Consequently, explanations of clutch performance have primarily been centred in theoretical frameworks underpinning related constructs (e.g., choking; Hill et al., 2017), with limited exploration of how the processes underlying clutch performance may differ. In response to these issues, the aims of this study were to qualitatively assess individual episodes of successful performance under pressure to explore athletes' perceptions of the clutch (i.e., situational factors and subjective appraisal), and how this perception was viewed to impact their performance.

3.2.1 What is the Clutch?

Common definitions of clutch performance differ with regard to what conditions represent the clutch. The most widely used definitions of clutch performance are those provided by Otten (2009) and Hibbs (2010) (see Schweickle et al. 2020 for a review; Study 1). Otten (2009) defined clutch performance as “any performance increment or superior performance that occurs under pressure circumstances” (p. 584). Accordingly, Otten (2009) outlined *pressure circumstances* as the necessary condition for clutch performances to occur. Whether these circumstances refer to specific situational variables (e.g., playoffs), or may be more subjective (e.g., appraisal by the individual athlete), is unclear, and largely relies on how one conceptualises pressure. Hibbs (2010) delineated that clutch performances must occur in a *clutch situation*, defined as “a point in a competitive sport where the success or failure of the participants has a significant impact on the outcome of the contest” (p. 48). Hibbs' (2010) definition, therefore, introduces an outcome requirement as part of the necessary and sufficient conditions for clutch performances to occur. Indeed, Hibbs (2010) specified that such situations are

clutch because “of the psychological challenge presented by those circumstances” (p. 52), with a clutch performance occurring when an athlete performs “in accordance with their ability despite the pressure associated with the circumstances of a clutch moment” (p. 56).

Both Otten’s (2009) and Hibbs’ (2010) definitions recognise the experience of pressure as the psychological foundation for clutch performance. That is, clutch performances are so because athletes are able to perform well despite the experience of increased pressure. At its core, therefore, the clutch broadly relates to this experience of increased pressure in sport. However, whether this pressure stems from situational variables (and what these variables may be), or is any subjective appraisal, remains an unanswered question in this field. Indeed, such inconsistency in approaches to conceptualising pressure has resulted in the field lacking consensus on the foundational issue of when clutch performances occur.

The notion that pressure comes from, or exists within, the situation itself, is the dominant approach in clutch performance research. Pressure in sport is defined⁸ as “the presence of situational incentives for optimal, maximal, or superior performance” (Baumeister & Showers, 1986, p. 362). For example, Hibbs (2010) outlined that athletes experience pressure because of the outcome-changing potential of a clutch situation (e.g., a kicker in American football taking a field goal to win the game). Meanwhile, archival studies, which comprise the majority of clutch performance research, have used certain in-game circumstances as “objective” pressure situations. For example, studies examining clutch performance in the National Basketball Association (NBA) have used a range of in-game situations to represent the clutch, such as: the last 30-seconds of

⁸ We recognise that Baumeister's (1984) definition of pressure as “any factor or combination of factors that increases the importance of performing well on a particular occasion” (p. 610) is also widely used. However, for the purpose of this paper, we consider these definitions, and their underlying assumptions, analogous

games within a five-point differential (Cao et al., 2011); the 4th quarter of playoff games (Wallace et al., 2013); and, the last five-minutes of the last 20 regular season games, when the score was within six-points (Solomonov et al., 2015). Inherent in archival approaches are the assumptions that pressure is experienced categorically (i.e., athletes experience pressure in certain situations, and either less or no pressure in others) and uniformly (i.e., all athletes experience increased pressure in certain situations, whilst all athletes in other situations do not). Indeed, these approaches suggest a relatively simple causal process underlying the experience of pressure, in which the combination of certain, pre-specified variables, always results in athletes' appraising pressure. Treating pressure solely as a situational variable, however, may overlook the subjective nature of pressure.

In contrast to treating pressure as a situational variable, a number of studies have instead relied upon the subjective appraisal of athletes and performers as a measure of pressure. Baumeister and Showers (1986) specified that to experience pressure, a performer must be both aware of the incentives for optimal performance, and motivated to perform well in response to these incentives. Indeed, Baumeister (1984) noted that "the fact that subjects could avoid the effects of pressure by internally abandoning the goal also implies that the situation alone does not create pressure" (p. 617). Underlying Baumeister's and Showers' (1986) definition of pressure, therefore, is a recognition that pressure is dependent upon the appraisal of the situation by the athlete, rather than the situation itself. A number of qualitative studies have focused on this subjective appraisal. For example, in exploring clutch states (the psychological state proposed to underlie clutch performance), Swann et al. (2017a, 2017b, 2019) reported on performers who experienced such states outside of the aforementioned objective pressure situations, such as: training (Swann et al., 2017a); dangerous situations (e.g., polar expeditions;

Swann et al., 2017b); and, recreational exercise (e.g., yoga; Swann et al., 2019). To date, however, there have been no studies which aim to bring together these two different approaches to examining pressure. As such, this study aimed to fill this void by exploring the subjective perceptions of athletes during events with objective sources of situational pressure.

3.2.2 Theoretical Explanations of Clutch Performance

Clutch performance and choking have often been suggested to represent opposite ends of the same spectrum (e.g., Otten, 2013), with choking defined as “an acute and considerable decrease in skill execution and performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure” (Mesagno & Hill, 2013a, p. 274). As such, the same theoretical models have been used to explain the mechanisms underlying both clutch performance and choking. For example, attentional theories (e.g., McEwan et al., 2012), distraction theories (e.g., Maher et al., 2018), and the self-presentation model (e.g., Hill et al., 2017) have all been suggested as potential explanations of how performance may improve under pressure. Notwithstanding discrepancies in the specific processes and mechanisms, these theories and models all center on performance responses to anxiety.

Adopting theoretical explanations of clutch performance only based on responses to anxiety, however, is problematic. Whilst definitions of choking specify increased anxiety as part of the phenomena (Mesagno & Hill, 2013a), definitions of clutch performance do not share this same stipulation of experiencing anxiety (Hibbs, 2010; Otten, 2009). Despite this, experimental designs examining clutch performance have relied on psychometric measures of anxiety to assess whether participants have experienced pressure (Gray et al., 2013; Gray & Cañal-Bruland, 2015; Otten, 2009). The use of such measures is based on the assumption that pressure results in increased

anxiety. This assumption, however, has been suggested as a “substantial oversimplification” (Eysenck & Wilson, 2016, p. 332). Specifically, anxiety is “a specific negative emotional response to competitive stressors” (Mellalieu et al., 2006, p. 3), and it is unclear if the emotionally neutral definition of pressure, provided by Baumeister and Showers (1986), always results in anxiety (Schweickle et al., 2020; Study 1). Current explanations of clutch performance, therefore, are based on the potentially limited assumption that anxiety increases during the clutch. As such, an aim of this study was to examine athletes’ reflections of their emotional responses during such moments, in an effort to understand if pressure may facilitate performance beyond current anxiety-based explanations.

3.2.3 The Current Study

The study aimed to examine athletes’ perceptions of the clutch in clutch performance. Specifically, we sought to explore: (1) athletes’ perceptions and experience of pressure during important events; (2) whether pressure was perceived to influence the athlete’s performance; and (3) whether athletes experienced anxiety during clutch performances. Given the suggested measurement limitations of archival and experimental designs (e.g., Schweickle et al., 2020; Study 1), we deemed that a qualitative approach was the most appropriate methodology to explore these questions. Specifically, we aimed to interview athletes after successful performances in events which were likely to involve increased sources of situational pressure (i.e., finals, knockout competitions; Baumeister & Showers, 1986). By focusing on such events, we sought a deeper understanding of the relationship between situational factors typically viewed to increase pressure (Hibbs, 2010; Solomonov et al., 2015; Otten & Barrett, 2013), and the athlete’s appraisal of pressure. To maximise the detail and accuracy of the athletes’ recall of these situations and their performance, we utilised an event-

focused approach, which involved interviewing athletes as soon as possible after the event (Brewer et al., 1991; Swann et al., 2016; Yarrow et al., 1970). Ultimately, this study sought to provide clarity on the concept of the clutch in sport, which has been treated as both an objective situation (e.g., Solomonov et al., 2015) and a subjective appraisal (e.g., Swann et al., 2017a), and in doing so, contribute towards recent calls for a refined definition of clutch performance (Schweickle et al., 2020; Study 1).

3.3 Methods

3.3.1 Approach

This study adopted a critical realist approach. Critical realism espouses a realist ontology (an independent world exists beyond our own constructions) with a constructivist epistemology (our knowledge of this world is inevitably interpretive, partial, and fallible) (Maxwell, 2012). Fundamentally, critical realists are interested in the process of what caused an event (i.e., clutch performance) to occur (Easton, 2010). Under this view, the world consists of entities (i.e., ideas, attitudes, relationships) endowed with causal forces (powers and liabilities). The activation of these forces (through the exercising of mechanisms) causes events to occur (Easton, 2010). However, as the social world (to which sport belongs) is a complex system, these entities and their causal forces interact simultaneously, and may affect, subsume, and be subsumed by other entities (Easton, 2010; Haigh et al., 2019). Accordingly, understanding the causality of events is complex, and cannot simply be reduced to the sum of their constituent parts (Easton, 2010; Nichol et al., 2019), such as the assumption that the combination of certain situational factors always results in the experience of pressure. Causal mechanisms, therefore, are the process of the interaction between different entities, and their causal forces and conditions, resulting in a case

where “the same mechanism may sometimes produce different events, and conversely, the same type of event may have different causes” (Sayer, 1992, p. 116).

Qualitative methodologies have been argued to facilitate comprehensive exploration of complex, causal processes (Miles & Huberman, 1984), and as such, are particularly suited to examining the aims of the current study. Whilst critical realism is compatible with any method that increases our understanding of the world (Maxwell, 2012), event-focused interviews were employed in this study. Event-focused interviews aim to facilitate the retention of the chronological and contextual connections between events (e.g., Swann et al., 2017b). This is important as critical realism does not view causal processes as fixed, but rather contingent on the context in which they occur (Pawson & Tilley, 1997). More generally, interviews offer a valuable method of understanding participant experiences (Smith & Sparkes, 2019). Event-focused interviews, therefore, offer a method of capturing experience-near data which occurs in naturalistic settings (e.g., Csikszentmihalyi, 2000), without the potential invasiveness of other experience-near, or momentary assessment, methods (e.g., wearing recording equipment in methods such as Think Aloud; Whitehead et al., 2016).

3.3.2 Participants

Participants in this study were 16 athletes (13 male, 3 female) who had reported performing well under pressure in a recent sporting event. These participants ($M_{\text{age}} = 26.88$, $SD = 9.03$) were from Australia ($n = 14$), England ($n = 1$), and Ireland ($n = 1$). The sports they participated in were: football (soccer) ($n = 5$); sport climbing ($n = 3$); CrossFit ($n = 2$); submission grappling ($n = 1$); bodyboarding ($n = 1$); powerlifting ($n = 1$); camogie ($n = 1$); rugby league ($n = 1$); and sprint distance triathlon ($n = 1$). Participants ranged from competitive-elite (e.g., regularly competing in top-tier leagues, or at international competitions) to recreational (Swann et al., 2015). Despite the

majority of participants being classified as either competitive-elite ($n = 2$) or semi-elite ($n = 10$), no participants in this study were full-time professional athletes. Rather, participants were either semi-professional or recreational (i.e., unpaid). Table 3.1 presents participant expertise and their sampling rationale. Participants were interviewed on average within four days of the event ($M = 96$ hours after the event; $SD = 45$ hours). Interviews ranged from within one day of the event to 8 days after the event. On average, the interviews lasted 55 minutes ($SD = 9.95$ minutes).

Table 3.1

Participant Expertise and Sampling Rationale

Sport	Days later	Standard	Sampling Rationale
Bodyboarding	0	Semi-elite	Won national university final
Camogie	3	Semi-elite	Won national preliminary final (2 nd tier)
CrossFit 1	1	Recreational	3 rd place in university knockout competition
CrossFit 2	5	Recreational	Self-reported positive performance in university knockout competition
Powerlifting	4	Semi-elite	Won division in metropolitan cup competition
Rugby League	3	Semi-elite	Self-reported positive performance in trial game (top tier)
Football 1	3	Recreational	Self-reported positive performance in preliminary final
Football 2	1	Semi-elite	Won national university final
Football 3	4	Semi-elite	Won national final (2 nd tier)
Football 4	8	Semi-elite	Won national final (2 nd tier)
Football 5	4	Semi-elite	Self-reported positive performance in international university final
Sport Climbing 1	1	Competitive-elite	2 nd place overall national finals
Sport Climbing 2	3	Semi-elite	3 rd event one, 7 th event two; national finals
Sport Climbing 3	4	Competitive-elite	1 st place overall national finals
Submission Grappling	5	Semi-elite	Won invitational match
Triathlon	5	Recreational	Top 10 finish in age/sex category

3.3.3 Sampling and Recruitment

A purposive sampling strategy was used in this study (Palinkas et al., 2015). We intentionally avoided asking potential participants if they had a “clutch performance” in

the recruitment stage. This decision was made to reduce the risk of excluding participants with potentially relevant experiences based on their preconceived understandings of what the term meant. For example, participants may have understood clutch performance as being a game deciding play (i.e., Hibbs, 2010) based on their previous exposure to the term, which may have excluded performances satisfying other definitions of clutch performance (e.g., Otten, 2009). Further, as current definitions provide no temporal limits of what constitutes clutch performance (i.e., if a clutch performance refers to an isolated moment, an entire game, or an entire tournament), the primary criterion for determining inclusion in the study was if a participant reported that, overall, they performed well under pressure.

To recruit potential participants, the first author attended sporting events which were likely to involve elevated pressure (i.e., finals, knockout competitions; Baumeister & Showers, 1986). The first author then approached participants after the event had finished. This included approaching both winners of events and other highly placed finishers. Seven participants were recruited in this manner. If the research team was made aware of a potentially relevant performance (e.g., via social media, personal contacts, or through snowball sampling), the first author contacted potential participants to see if they met the criteria for inclusion, and if so, invited them to participate. Nine participants were recruited this way. Whilst the first author attended and made contact with potential participants who had competed in events likely to involve increased sources of pressure (Baumeister & Showers, 1986), the primary criterion for recruitment was that the participant appraised pressure at some point throughout the event. Therefore, the participants ultimately determined what constituted a pressurised event. Further, and in line with our critical realist approach, which emphasises the role of context in understanding psychological processes, mechanisms, and outcomes

(Maxwell, 2012; Pawson & Tilley, 1997), we actively sought athletes from a range of standards and sports to explore the potential impact of context on the process and evaluation of clutch performances.

3.3.4 Procedure

Ethical approval for the study was granted by a university ethics committee prior to commencement. Participants were approached or contacted by the first author and asked if they felt like they had performed well under pressure. They were then asked if they were interested in participating in an interview. Upon agreeing, the interviews were arranged to take place as soon as possible and when convenient. Four interviews were conducted in person, with the remaining interviews conducted via Zoom software online ($n = 2$) or via telephone ($n = 10$). The use of the different interview methods reflects the aim to collect data as soon as possible, and the fact that some participants were living interstate or overseas. In consideration of the potential drawbacks of using telephone interviews (e.g., Holt, 2010), a specific process was used to develop rapport in both telephone and face to face interviews. This included introducing the project and the interviewer's background, providing the opportunity to ask questions, and scheduling the interview at a time that was most convenient for the participant (DiCicco-Bloom & Crabtree, 2006). All participants were provided with an information sheet and consent form prior to being interviewed and provided consent prior to the interview beginning. All interviews were recorded and transcribed verbatim.

Given the criticisms levelled at using the concept of data saturation when adopting a reflexive thematic analysis approach (Braun & Clarke, 2019b), the concept of information power was instead utilised to determine when an appropriate sample size had been reached (Malterud et al., 2016). The basic premise of information power is that the larger the information power a sample holds, the lower sample size is needed,

and vice versa. To determine this, one must consider the aims of the study, sample specificity, the use of theory, quality of dialogue, and analysis strategy (Malterud et al., 2016). Following ongoing consultation between the research team throughout all stages of the data collection and analysis process, it was determined we had reached an appropriate sample size to achieve the aims of the current study. Despite using cross-case analysis (see below), we agreed that the specificity of the sample was dense, contained strong quality of dialogue, and we were able to draw on established concepts and theory (Malterud et al., 2016). Of note, our sample size is similar to other studies adopting event-focused methods (Swann et al., 2017a), and exceeds minimum sample size suggestions for thematic analysis (e.g., Braun et al., 2019).

3.3.5 Interview Schedule

An event-focused, semi-structured interview approach was utilised. The event-focused interview focuses on interviewing participants based on a single event, as soon as possible after the event. This event-focus differs from “career-based” interviews (Jackman et al., 2017, p. 114), which may involve participants reflecting on experiences that could have occurred weeks, months, or years in the past (Swann et al., 2016). Specifically, event-focused interviews focus on obtaining detailed contextual data and chronological insights into participants experience. In addition to being event-focused, the interviews adopted a semi-structured, open-ended approach to allow new discussions to occur. In line with our critical realist philosophy, participants were encouraged to challenge and clarify any assumptions that did not correspond with their experience (Ronkainen & Wiltshire, 2019). All interviews were conducted by the first author, who had previously conducted event-focused, semi-structured interviews and previously published in the area of clutch performance (Schweickle et al., 2021; Study 2). A similar approach was taken to previous studies adopting event-focused interviews

in sport (Jackman et al., 2017, 2020; Swann et al., 2016, 2017a, 2017b, 2019). Specifically, the interview addressed: (i) general understandings of the concepts discussed (e.g., “what does pressure in sport mean to you”); (ii) overall reflections of their performance in the event (e.g., “why did you report performing well under pressure in this event”); (iii) chronological recall of the event (e.g., “from start to finish, describe any periods of heightened pressure”); and, (iv) exploration of the psychological processes and indicators of performance during moments of positive performance under pressure (e.g., “what were you feeling at that point”). All interviews finished with the researcher providing an overall reflection of the discussion and checking if anything had been missed or misrepresented.

3.3.6 Data Analysis

The current study used reflexive thematic analysis (Braun & Clarke, 2019a). This approach recognises the active role that the researcher plays in both engaging with and interpreting the data. Reflexive thematic analysis aligns with our critical realist philosophy, which acknowledges that researchers bring different beliefs, values, and dispositions to a study (Maxwell, 2012), and recognises the reflexive nature of qualitative interactions (e.g., Hammersley & Atkinson, 2007). The analytical process followed Braun and Clarke's (2006, 2013) six phases of thematic analysis. An abductive approach was adopted, which assumes familiarity with existing theories and concepts from the outset (e.g., current definitions of clutch performance), but allows generation of novel insights and ideas that go beyond initial theoretical premises (Danermark et al., 1997; Meyer & Lunnay, 2013). Analysis began with familiarisation of the dataset, which involved reading and re-reading the transcripts (Braun & Clarke, 2006, 2013). The first author then developed initial codes from the data, with each generated to represent one single idea (e.g., *internal expectations*). These codes were then

categorised into themes under a central organising concept (e.g., *The Clutch Involves Situational and Subjective Factors*). At all stages in this analysis a team approach was adopted (see *critical friends* below).

3.3.7 Validity

A critical realist perspective views validity as relating “to the accounts or conclusions reached by using a particular method in a particular context for a particular purpose, not to the method itself” (Maxwell, 2012, p. 130). As such, the use of universal criteria or checklists (e.g., Tracy, 2010) to establish validity is rejected on epistemological grounds. Accordingly, we drew on the suggestions provided by Ronkainen and Wiltshire (2019), and originally suggested by Maxwell (2012), in establishing validity in realist accounts.

In considering the empirical adequacy of the accounts, all interviews were recorded, transcribed verbatim, and then the transcripts checked for accuracy (i.e., checking the interview was transcribed accurately). Further, event-focused interviews were utilised in an effort to facilitate the retention of important contextual or chronological details of the performances (e.g., Swann et al., 2016). We considered the retention of such performance details (e.g., score, position, time remaining), in combination with perception of such events (i.e., what was the participant experiencing), as important in exploring the aims of the current study. To establish ontological plausibility, both formal and informal peer debrief was conducted through all stages of the study. In this process, the co-authors acted as critical friends. This process included: examining interviews early in the data collection phase to explore alternate questions; challenging the first authors assumptions in both code and theme generation; and, engaging in reflexive deliberation to provide an account of clutch performance that most closely represented the phenomena. For example, such

deliberation involved extensive dialogue surrounding how the clutch should be defined and conceptualised to most accurately represent the participants experiences, whilst also considering the philosophical assumptions underlying the current study. Indeed, through this deliberation, which also involved further reflection during the peer review process, our conceptualisation of the clutch was progressively refined towards an understanding of the clutch as a complex and multiply determined event (e.g., Easton, 2010).

Lastly, Ronkainen and Wiltshire (2019) outline that practical utility of a research account is an important consideration in validity. Whilst the aims of the current study are not directed at applied practice, we view the outcomes of this study as an essential step in understanding what clutch performance is. Inherently, understanding what clutch performance is will underlie future efforts to intervene with athletes and promote such performances in the real-world. Importantly, the practices listed above to establish validity are not unique to critical realist accounts and may be utilised across different paradigms (e.g., critical friends and peer debrief may be used in interpretivist accounts; Smith & McGannon, 2018).

3.4 Results

The aims of this study were to qualitatively examine individual episodes of clutch performance to explore athletes' perceptions of the clutch (i.e., pressure appraisal and anxiety responses) in clutch performance, and how the clutch was viewed to impact their performance. In response to these aims, four themes were generated: (i) *the clutch involves situational and subjective factors*; (ii) *the perception of the clutch comes and goes*; (iii) *pressure affects performance, and performance affects pressure*; (iv) *experience of anxiety during the clutch is varied*. These themes, the codes from which they were generated, and examples of raw data, are provided in Table 3.2, and discussed in detail below.

Table 3.2*Raw Data Examples, Codes, and Themes*

Raw Data Examples	Codes	Themes
I walk out there, I see like a load of faces looking at me and freak out a little bit	Situational factors	The Clutch Involves Situational and Subjective Factors
There was more pressure in that semi-final, because that was the real test	Pressure appraisal did not reflect situational incentives	
Meeting my expectations	Internal expectations	
More pressure on me, compared to other competitions where I haven't had that expectation from others	External expectations	
Anticipation was probably the worst part for the pressure	Before an event	The Perception of the Clutch Comes and Goes
Where you are stopped and having breaks... that's when you feel that expectation and that pressure	Breaks in play	
And then we were up, and then they equalised again. So, it was sort of okay, the pressures back on	Situational changes	
If you don't get your first touch right. Straight away your confidence is going down... pressure sets in	First involvement	
Some of the acute, the one ball phases, they can be quite pressurized, but in an acute sense	Increased pressure in the act of performing	
You go into autopilot	Performing automatically	
That pressure helps you to dig a little bit deeper	Pressure is facilitative to performance	
When you feel that kick... you've got to go 'no, I can't ride to that kick', because you need to stay pacing	Managing the influence of pressure	
During the actual game I didn't find that it affected me at all	Limited influence of pressure	
We've had chances. That gave the whole team confidence which sort of eased the pressure	Positive performance reduces appraisal of pressure	
Pressure arises where you're not performing, and that's when you've got to go 'ok, what am I doing, what's gone wrong here'	Underperformance increases appraisal of pressure	
I didn't feel anxious or anything	Pressure did not result in anxious emotions	Experience of Anxiety During the Clutch is Varied
It was the first 5-10 (minutes), I was feeling those feelings definitely	Pressure did result in anxious emotions	
All self-talk. Like trigger word, like come on, let's go. Let's do it... it just gets me going	Coping strategies to manage anxious emotional responses	
It could have been nervous energy, but in the first five minutes, we were out of the blocks	Negative emotions can be interpreted facilitatively	
I really do want to perform well... but I can only control what I can control.	Perceived control may determine emotional responses	

3.4.1 The Clutch Involves Situational and Subjective Factors

All participants reported that the event in which they participated involved heightened pressure circumstances. The sources and appraisal of this pressure, however, differed between participants. Participants reported that *situational factors* could influence the appraisal of pressure. For example, Football Player 4 reflected: “I think the thing that hit me most was the exposure. Knowing that people around the country would be watching the game... reflecting that you may, you know, may never be in one of these games again”. However, a number of participants also reported that *pressure appraisal did not reflect situational incentives*. For example, contrasting the appraisal between a trial game (the event of interest) and two previous performances (a World Cup qualifier and a Grand Final), a Rugby League player reflected:

the stakes were really high, it was a World Cup qualifier, win we make it. And all the like effort of the last six years has been building up to that... and we don't get another chance until 2025... just because I sort of was so confident with how it was going to go and that we were going to win, I didn't feel as much pressure... the last game I played before that was my Grand Final... and it was the culmination of our season... I sort of always feel like at that level, I'm pretty established... So I don't feel like an enormous amount of pressure to perform, because I'm accustomed to it.... Whereas this was the first that I'm playing at that NRL (National Rugby League) level... having not experienced that before, I felt like it was pretty unique in terms of pressure.

Indeed, participants reported that the extent to which they appraised the event as pressurised was shaped by both *internal expectations* and *external expectations*.

Highlighting the role of *internal expectations* in contributing to increasing the appraisal of pressure for the event, Sport Climber 2 reflected: “pressure is almost linked in with

expectations. If you know everyone else who's competing, you start to put yourself in like, 'oh, she's stronger than me'... I think it's sort of in line with expectations”.

Meanwhile, Soccer Player 2 noted how *external expectations* increased their experience of pressure: “I just think it was the coach, the expectation he put on us... It was no pressure I'd put on myself. It was all from the coach”. Taken together, these findings suggest that whilst the clutch may involve situational factors (i.e., crowds, finals), the perception of such factors is central in the appraisal of pressure, which may further be influenced by other subjective components (e.g., an athlete's perceived performance expectations).

3.4.2 The Perception of The Clutch Comes and Goes

Whilst all participants reported that they perceived heightened pressure in relation to the overall event, the awareness and appraisal of this pressure fluctuated throughout the event, suggesting that there may be fluctuating episodes of the clutch within an overall clutch performance. A number of participants reported that they were most aware of pressure during *breaks in play* or *before an event*: “once you're out there everything just switches off and you're just back into game mode. I feel the pressure more before the performance, and then at halftime, like in the breaks. But during the actual play I don't feel it” (Soccer Player 2). Increased awareness and appraisal of pressure during breaks in play also occurred within the performance, however, as Soccer Player 1 reflected before taking a penalty kick:

there's no stopping and starting, it's really hard to isolate moments of pressure, it just feels like in the game, like you can't sort of be aware of certain situations enough to feel those moments of clutch... this was a different scenario because early in the game, we've got a penalty... the game stopped. Everyone knew

what that meant. As soon as they blow the whistle and point to the spot, I'm the penalty taker, I know what that means.

A number of participants reported that they were both aware of, and appraised, *increased pressure whilst in the act of performing*. For example, a Rugby League player noted: "things are happening pretty fast, I wasn't thinking about it too much... only that first carry, before you're getting the ball, where you're just like 'don't drop it'".

Furthermore, *situational changes*, such as changes in game score, tactics, or game involvement, were reported to influence the appraisal of pressure. For example, Soccer Player 5 highlighted that "there was a moment, about five minutes before the 90, we copped a few set pieces against us... few thoughts running through my head, like where I'm thinking 'ah [expletive], if I let it in, then we're out, and we don't get a second chance'". A particular episode of increased pressure that participants highlighted was their *first involvement in the event*. For example, Sport Climber 1 reflected: "there's a lot of pressure and a lot of build-up, and all that goes into pulling on for the first time. That always feels a bit of a high-pressure moment". In contrast, a number of participants reported feeling that they were *performing automatically*, with little awareness and appraisal of pressure during the performance itself: "as soon as I'm focused on the actual actions about what I'm doing during the match I don't really feel the pressure, because I'm not really worrying about it" (Submission Grappler). Indeed, this appeared to be a deliberate strategy to try to focus on the task: "as I'm walking out, I kind of just accept the pressure and accept that what's about to happen and then I feel a bit more relaxed once the waiting's over" (Submission Grappler).

Beyond being appraised at the event level, athletes awareness and appraisal of the clutch appears to fluctuate throughout an event. This theme suggests that there may be multiple micro-episodes of increased pressure within an overall, pressurised event.

On one hand, it appears that athletes may perceive multiple episodes of the clutch (i.e., athletes are aware of, and appraise, increased pressure) throughout the event, which may be related to situational factors (i.e., amount of stoppages in play, length of contest, situational changes). On the other hand, athletes may not perceive these fluctuating episodes of increased pressure and perform automatically, yet may still perceive the event itself as a clutch event (i.e., appraise increased pressure leading into the event).

3.4.3 Pressure Affects Performance, and Performance Affects Pressure

Pressure was reported to have a varied influence on performance, ranging from having facilitative effects, to the potential for debilitating effects. A number of participants viewed *pressure as facilitative to performance*. Some participants reflected this at a somatic level: “the intensity of the occasion was definitely spurring me on... I felt a genuine, like, boost of energy from that. Which I needed” (Soccer Player 3). Other participants, meanwhile, reflected that pressure was facilitative at the cognitive level: “it's actually helping me to perform better because I'm so very, very conscious of not doing anything technically incorrect” (Powerlifter). In contrast, a number of participants reflected that they tried to actively *manage the influence of pressure*, highlighting a recognition that pressure can result in undesirable performance effects. For example, Soccer Player 1 reflected:

I've really thought my penalty taking, and to get rid of this sense of pressure, to the point where it would impact my performance, I've just really tried to nail it down to the process. And in that moment, that's exactly how I frame it to myself.

Together, these codes suggest the clutch can have a varied influence on performance.

This interplay between the potential of pressure to be facilitative, or debilitating, towards performance is encapsulated by Sport Climber 3:

it's just a matter of kind of working out how much you want it and then, and leading yourself into how much you want it, and what it would feel like to have climbed it, or to have achieved that, you know, competition result... And really feel it, and then calm it down from there, and relax, and concentrate on breathing, and keeping my heart rate under control. That seems to be a bit of a happy ground for me, for performing well.

As previously reported, participants were not always cognisant of pressure throughout the event. As such, some participants also reported that pressure had *limited influence on their performance*: “it didn’t really detract from it, but didn’t really add anything towards me in anyway either” (Submission Grappler). Collectively, these participants reported that during clutch performances, the influence of the clutch on performance is varied, and may depend on how the participants frame the appraisal of pressure, and the extent to which they are cognisant of pressure.

Beyond the influence of pressure on performance, participants also reflected that performance could influence the awareness and appraisal of pressure. On one hand, participants reflected that *positive performance reduced the appraisal of pressure*. Soccer player 5 reflected: “I think I took a good corner. I came out, was heaps loud. Heaps loud, heaps dominant, came and claimed it, and it just felt like I was in the zone from then”. On the other hand, athletes reflected that *underperformance can increase the appraisal of pressure*. As Soccer player 2 reflected: “if I’m playing well and I’ve played good passes and played my role well, then it’s good. Whereas if you do make an error or pass the ball over to the other team then I think you can kind of manifest a little bit... the error feels a lot larger than it actually was.” However, an increased appraisal of pressure in response to underperformance wasn’t necessarily detrimental to overall

performance, and largely depended on the participants framing and interpretation of that situation:

having that, in a sense, failure, you can choose to making it a positive thing, and turn it around it something... and feeling that failure makes you realise how much you actually really [expletive] want it... it made me switch on, and really kind of get into business for the next one (Sport Climber 3).

Of note, whilst participants underperformed in periods, no participants reported a choking response (i.e., an acute and significant performance decrease). The potential for performance to influence pressure appraisal further highlights how the appraisal of the clutch within a performance may be subjectively influenced, and further, occur in fluctuating episodes.

3.4.4 Experience of Anxiety During the Clutch is Varied

Inherently, the clutch involves the appraisal of pressure. However, the experience of anxiety in response to this pressure appraisal differed between participants. Firstly, for some participants the appraisal of *pressure did not result in anxious emotional responses*. For example, a Camogie player reported “I wouldn’t say I ever felt anxious in the game. I was intense, but I wasn’t anxious”. It was also noted, however, that *pressure did result in anxious emotional responses*. However, participants reported that by using *coping strategies to manage anxious emotional responses*, such as self-talk or reframing, they were still able to produce a clutch performance, despite the experience of anxiety. This process, in which there is an initial experience of anxiety, followed by the use of effective coping strategies, is encapsulated by Sport Climber 3:

I’m just stuck there and I’m trying to work it out... I’m going to come off here at the third quick draw, and it's all going to be over, because if I didn't do well in

that, on that route, it meant that I wasn't going to get to the finals obviously, which also had ramifications for Olympic qualification. It was just like, oh wow. All this work and training and effort could just fall apart right now, this could be it... and I just kept on thinking, just keep it calm, you've still got enough time. And then there was a moment where it's like, okay, cool, you're going to have to just commit to something... that was enough to place me in first going into the final.

Participants also reported that *anxious emotional responses could be interpreted facilitatively*. As a Triathlete reflected:

when I saw the time slip, I was like 'oh no, this is no good'. I was like 'nah I can't have it over', you know, 'I can't have a 5-minute race', like I felt disappointed that I didn't want that. And I already felt that, so I responded to that emotion, I guess, and said, 'I'm going for it'... I saw 5 minutes on my watch. And that spurred me on, I went 'no I don't want this, I'm going to kick it into gear, and get this time down.'

Lastly, participants reported that *perceived control* was important in determining emotional responses to clutch situations. For example, a Camogie player reported "I felt completely in control, I felt like I understood what was going on, what they were trying to do, nothing bamboozled me". In sum, this theme highlights that whilst anxiety may be experienced during some clutch performances, it is not a feature of all clutch performances, suggesting a need to go beyond anxiety-based explanations of clutch performance.

3.5 Discussion

The aims of this study were to qualitatively examine individual episodes of clutch performance to explore athletes' perceptions of the clutch (i.e., pressure appraisal

and anxiety responses) in clutch performance, and how the appraisal of the clutch was viewed to impact their performance. The findings suggest that experiencing the clutch involves both the appraisal of situational factors, which may differ between athletes, as well as an athlete's perceived expectations surrounding their own performance. The awareness and appraisal of this pressure, however, may fluctuate throughout a sporting event, suggesting that there may be distinct, and multiple, episodes of clutch throughout the event. The effect of pressure on performance was dynamic, with some athletes viewing it as facilitative, whilst others successfully managed the perceived debilitating effects of pressure. Lastly, the appraisal of pressure did not always result in the experience of anxiety, suggesting that the psychological process underlying clutch performance may be diverse. These themes are iterative and overlapping, in that during one event, the awareness and appraisal of pressure, and the performance and emotional experiences in response to this appraisal, may interact and occur multiple times. Whilst it is important to view these findings in the context in which they occurred (i.e., primarily Australian athletes ranging from recreational to competitive-elite status), we believe these findings carry the potential for conceptual generalisability (Smith, 2018). That is, by examining the concept of the clutch through a different lens, these new conceptual understandings of clutch performance may be generalisable to other areas. Generalisations stemming from these findings are not fixed, however, but rather represent a fluid idea open to refutation and challenge (Atkinson, 2017). These findings, and their implications for the definition, measurement, and theoretical explanations of clutch performance, are discussed below.

3.5.1 Defining the Clutch

These findings indicate that foundationally, the clutch may be considered an appraisal of increased pressure. Indeed, without the awareness and appraisal of pressure,

there is not the required psychological challenge underlying why clutch performances are of interest (Hibbs, 2010). This appraisal, however, appears to be the product of a number of interacting entities, suggesting that the clutch is a complex, multiply determined event (e.g., Easton, 2010). Specifically, it appears that: situational factors (and whether these factors change); appraisal of situational factors; perceived performance expectations (from internal and external sources); the build-up to an event; breaks in play; performance during the event itself; and, how one copes with anxious emotions, may all interact to determine the experience of the clutch. In line with our critical realist approach, the clutch may therefore be positioned as a real event (i.e., it occurs as a result of a number of interacting entities) that is also contingent upon the athlete's own constructions and interpretations (such as being aware of, and appraising, the clutch). Further, it is not the case that a combination of these entities will always cause the experience of the clutch, but rather, these entities interact to exercise their influence in different contexts. The process of experiencing the clutch is therefore complex, multifaceted, and context dependent. As such, the clutch cannot solely be treated as an observable objective situation (as in archival designs), yet is also not completely independent of the influence of such situational variables.

The clutch may occur at multiple, temporal levels. Previous literature has considered a range of temporal boundaries for what constitutes a clutch performance, including: an individual skill (e.g., Gray et al., 2013); a specified period within a performance (e.g., last 30 seconds; Cao et al., 2011), or an entire performance (e.g., Hill & Hemmings, 2015). The current findings support previous literature which suggests that clutch performances may occur at different temporal levels. That is, multiple moments of clutch were reported to occur within an overall clutch performance. The current findings also suggested, however, that athletes may not always recall such

moments during a clutch performance. For instance, some athletes reported having little awareness of pressure whilst performing, reporting a sense of automaticity and absorption in their performance (e.g., Swann et al., 2017b), despite perceiving a clutch performance in regard to the overall event. As such, it may be necessary to separate the different temporal levels of the clutch, and by consequence, clutch performance. Of relevance, Thomas et al. (2009) suggested that competitive stress could be viewed through a micro-level perspective (e.g., a 'snapshot' of a performer's experience in one moment) or a meso-level perspective (e.g., a finite time period such as the lead up to an event). To draw on Thomas et al. (2009), a *clutch moment* may be considered a micro-level perspective which centres on pressure appraisal and performance during a specific competitive moment. An example of such a clutch moment from the current study may be a football player taking a penalty. Meanwhile, a *clutch performance* may represent pressure appraisal and performance at the overall event-level, which could take into account pre-event pressure. For example, this may refer to a football player's performance over an entire match. Delineating different temporal perspectives of clutch performance may allow exploration of whether the same processes and mechanisms underlie these different temporal episodes.

3.5.2 How Does the Clutch Influence Performance?

The current findings suggest that pressure appraisal and performance may influence each other in dynamic ways. A number of athletes viewed pressure as facilitative to performance, whilst in other instances, pressure was viewed as having potentially debilitating effects which had to be actively managed. It was also reported, however, that performance influenced subsequent appraisal of pressure. As such, the relationship between pressure and performance may share a bidirectional influence in certain contexts. Previous research in clutch performance has typically adopted a

unidirectional focus, examining the effects of pressure on performance (Schweickle et al., 2020; Study 1). Indeed, this focus reflects how the relationship between pressure and performance has typically been treated in the field of sport psychology more broadly, such as: examining home and away advantage in playoffs (McEwan, 2019); mental strength under pressure (e.g., Deutscher et al., 2013); and, choking under pressure (e.g., Ötting et al., 2020). In doing so, researchers may have overlooked the important role of previous performance in the appraisal of pressure, potentially resulting in inconsistent estimates of the effect of pressure on performance. Whilst it has been reported that performance errors increase future underperformance under pre-identified situational pressure (e.g., Harris et al., 2019), the current findings suggest that this may not always be the case. Specifically, whilst underperformance was reported to increase pressure appraisal, this could still lead to future positive performance if appropriate coping strategies were employed (e.g., reframing). In sum, pressure appraisal is perceived to have a diverse influence on performance, with this appraisal also influenced by previous performance.

Findings from the current study suggest that the experience of anxiety may not be a necessary condition of clutch performance. Previous explanations of clutch performance have predominantly used theories and models which focus on performance responses to anxiety (e.g., attentional theories; Gray et al., 2013). A number of athletes in the current study reported experiencing anxiety during clutch moments. In some instances, these symptoms were interpreted facilitatively (e.g., Mellalieu et al., 2006). In other instances, athletes reported utilising coping strategies to manage anxiety. However, not all athletes reported experiencing anxiety in response to pressure appraisal. Indeed, it has been suggested that cognitive biases, such as attentional biases (e.g., attending disproportionately to threat-related stimulus as opposed to a neutral one)

and interpretative biases (e.g., interpreting an ambiguous situation as threatening) may explain why some athletes experience anxiety in response to pressure, whilst others do not (Eysenck & Wilson, 2016). This finding has important implications for both measurement and theoretical explanations of clutch performance. Experimental research in clutch performance has exclusively used psychometric measures of anxiety as a measure of pressure (Gray et al., 2013; Gray & Cañal-Bruland, 2015; Otten, 2009). However, such measurement may overlook athletes who experience pressure but not anxiety, potentially misrepresenting the process of how clutch performances occur. Similarly, the theories and models predominantly used (i.e., self-focus theories, distraction theories, self-presentation model) to explain how clutch performances occur do not account for athletes who do not experience anxiety. As such, researchers should consider the extent to which anxiety-based measures and explanations can capture the potentially complex phenomena of clutch performance.

3.5.3 Refining Definitions of Clutch Performance

Schweickle et al. (2020; Study 1) recently highlighted that there is a need to refine the definition of clutch performance. An important step in establishing such a definition is understanding the conditions in which clutch performances occur. On the back of the current findings, we suggest this condition as an *appraisal of increased pressure*. This refinement contrasts with Hibbs' (2010) approach, who suggested that a clutch performance must occur in situations where the participant's performance has a significant impact on the outcome of the contest. Hibbs (2010) specified that such situations are necessary because they pose a psychological challenge of increased pressure, which the athlete must overcome. The current findings, however, suggest that this same challenge of increased pressure can occur outside of situations which have a significant impact on the outcome of the contest (i.e., in multiple moments throughout

an event, including first involvement). As such, Hibbs' (2010) approach seems inappropriate to capture all instances where athletes face a genuine psychological challenge of overcoming pressure.

The suggested condition of an appraisal of increased pressure aligns more closely with Otten's (2009) condition of clutch performances occurring "under pressure circumstances" (p. 584). However, the terminology of *pressure circumstances* may suggest that pressure exists as a situational variable. Indeed, Otten's (2009) definition has been applied widely within archival designs which focus on objective pressure situations (Otten & Barrett, 2013; Harris et al., 2019; Solomonov et al., 2015). By specifying pressure as an appraisal, rather than a circumstance, we endeavour to highlight that pressure is subjective, yet may be influenced by a range of both internal and situational sources. In summary, we define the clutch as an appraisal of increased pressure, which may occur in regard to the overall event, as well during moments throughout the event.

3.5.4 Limitations and Future Directions

There were a number of limitations to the current study. First, we focused primarily on traditionally high-pressure events, such as finals and knockout competitions (e.g., Baumeister & Showers, 1986). It may be the case that focusing on a broader range of events, such as standard competitive games, may have altered our understandings of what constitutes the clutch. Second, we drew on a sample primarily consisting of recreational and semi-elite athletes. It may be the case that athletes at higher levels of competition (i.e., world-class elite; Swann et al., 2015) have different sources of pressure. For example, factors such as perceived public expectation (e.g., Hodge & Smith, 2014) and performance requirements to maintain funding (e.g., McKay et al., 2008) may be more relevant to athletes competing at a higher level. Third, we

relied on snowball sampling to recruit a number of participants. Whilst snowball sampling is widely used in qualitative research, it is important to recognise that a number of critiques have been raised over the extent to which this strategy can ensure diversity (e.g., Kirchherr & Charles, 2018). Specifically, such a strategy may exclude 'hidden' populations (e.g., Braun & Clarke, 2013) or those who are initially reluctant to take part (e.g., Shaghaghi et al., 2011). However, by attending events and approaching a range of potential participants, efforts were made to recruit those who may be reluctant to reach out to the research team. Lastly, the sample was drawn from a number of Western, English speaking cultures. It is important to recognise that these findings, therefore, should be understood within this context. Indeed, it may be the case that the concepts of pressure and performance are understood differently across other cultures; for example, the suggestion that Eastern philosophies view sport as a vehicle for moral and spiritual development (e.g., Jenkins, 2008), rather than having a focus on external rewards. To address these limitations in future work, greater sample diversity in both eliteness and culture (in addition to the strategies used to recruit participants) should be considered.

To further the current findings, a number of future directions are evident. To continue working towards a refined definition of clutch performance (Schweickle et al., 2020; Study 1), researchers should focus on the necessary performance thresholds for clutch performance (i.e., does clutch performance necessitate increased performance, or is maintained performance sufficient for clutch performance?). In considering this research avenue, the different temporal episodes of clutch performance should be considered (i.e., clutch moments and clutch performances). Indeed, future research should explore whether the same processes underlie different temporal episodes of clutch performance. Further investigation into the relationship between pressure and

anxiety, which may include extending upon the current qualitative findings by utilising correlational or experimental designs, would help illuminate these processes in more detail. Lastly, the finding that the relationship between pressure and performance may be bidirectional should be considered in future research which aims to explore how clutch performances occur. Exploration of these research avenues will contribute towards further understandings of what clutch performance is, and how it occurs.

3.5.5 Conclusions

This study aimed to examine individual episodes of clutch performance to explore what the clutch in clutch performance is, and how the clutch may impact performance. The findings indicated that the clutch may be a multiply determined event that is influenced by the situation, perceptions of that situation, and other subjective factors. To encapsulate these varied influences, we suggest that clutch performances occur during an appraisal of increased pressure. Furthermore, it may be the case that there are multiple clutch moments within an overall clutch performance. The influence of increased pressure appraisal on performance was varied and dynamic, whilst performance was also reported to influence pressure appraisal. Lastly, anxiety was not always reported during periods of increased pressure appraisal, casting doubt over current theoretical explanations of clutch performance. Practitioners may benefit from these findings by recognising that the experience of the clutch is a complex phenomenon, that may differ between individual athletes. Future research is necessary to continue to work towards a refined definition of clutch performance, in an effort to understand how clutch performances occur, and develop strategies to promote clutch performance.

Chapter 4: Objective and Subjective Performance Indicators of Clutch Performance in Basketball: A Mixed Methods Multiple Case Study

4.1 Foreword

Results from the systematic review reported in Chapter 2 (Study 1; Schweickle et al., 2020) demonstrated that there was a lack of clarity over whether clutch performance should be evaluated using objective, or subjective, performance indicators. Accordingly, the aim of this Chapter (Study 3) was to understand whether athletes draw on objective indicators (e.g., performance statistics), subjective indicators (e.g., perceived performance), or a combination of both, to identify clutch performances. The following research (excluding abstract and reference list) has been submitted to the *Journal of Applied Sport Psychology* and reformatted for the thesis.

4.2 Introduction

The ability to perform under pressure is a fundamental aspect of successful sporting performance (Mesagno et al., 2020). Increased or successful performance under pressure in sport has been termed *clutch performance* (Hibbs, 2010; Otten, 2009). Sporting folklore is comprised of many athletes known for having produced clutch performances, such as: Jerry West's reputation as "Mr. Clutch" (West & Libby, 1969); Michael Jordan's "The Last Shot" to win the 1998 National Basketball Association (NBA) Championship (Woodyard, 2018); or "The Block" by LeBron James in the 2016 NBA Finals (McMenamin, 2016). Indeed, players who are perceived to be clutch performers are even paid more by NBA organisations (Sigler, 2020), whilst from an applied perspective, performing successfully under pressure may contribute towards making sport a more rewarding and enjoyable experience for athletes (Otten, 2013). Developing strategies to facilitate clutch performances, therefore, is an important avenue for sport psychology researchers and practitioners.

Limiting the development of such applied strategies is uncertainty over how to appropriately operationalise clutch performance. Specifically, prominent definitions of clutch performance (Hibbs, 2010; Otten, 2009) do not specify whether clutch performances should be assessed using objective performance indicators (e.g., statistics), subjective performance indicators (e.g., athlete's perceived performance), or some combination of both. This lack of definitional clarity has led to disparate attempts to measure clutch performance as both an objective, and subjective, phenomenon, and has hindered the development of a robust evidence base of how to facilitate clutch performances (Schweickle et al., 2020; Study 1). In response to this conceptual ambiguity, Schweickle et al. (2020; Study 1) recommended that researchers should examine the different types of performance indicators athletes utilise to identify clutch performance. Specifically, understanding whether athletes rely on objective performance indicators, subjective performance indicators, or a combination of both, is a meaningful step towards developing a more robust operational definition of clutch performance, which reflects athletes' experiences and understandings (Laas, 2017). Such definitional elucidation provides the foundation from which the development of theory and applied interventions can then take place (Wacker, 2004). Accordingly, the aim of the current study was to examine the types of performance indicators basketball players use to identify clutch performances. In doing so, we endeavoured to contribute towards calls for a more robust, athlete-centered definition of clutch performance (Schweickle et al., 2020; Study 1).

4.2.1 Clutch Performance as an Objective, or Subjective, Phenomenon

Prominent definitions do not specify whether clutch performance is an objective, or subjective, phenomenon. Otten (2009) defined clutch performance as “any performance increment or superior performance that occurs under pressure

circumstances” (p. 584). Otten’s (2009) definition has been applied in studies which have assessed clutch performance based on objective indicators (e.g., points scored; Solomonov et al., 2015) and subjective recall (e.g., participants instructed to recall a clutch performance episode; Hill et al., 2017). Meanwhile, Hibbs (2010) defined clutch performance as “when a participant in competitive sport succeeds at a competition-related, challenging task during a clutch situation” (p. 55). Specifically, Hibbs (2010) denotes that clutch performances must have “a significant impact on the outcome of the contest” (p. 48). Given the specification that a performer must also be successful, Hibbs’ (2010) definition appears to suggest that clutch performances only occur when the performer has won, introducing an objective, outcome-based criteria to assess clutch performance. However, as Hibbs’ (2010) definition has primarily been applied in qualitative studies examining clutch states (i.e., the psychological state purported to underlie clutch performance; Swann et al., 2019), which were reported in non-outcome-based situations (e.g., training and exercise; Swann et al., 2017a, 2017b, 2019), it appears that these definitional conditions remain vague, and in need of further clarification. In sum, neither Otten’s (2009) nor Hibbs’ (2010) definitions explicitly specify whether clutch performance is an objective, or subjective, phenomenon (or a combination of both), which has resulted in broad, and conflicting, approaches to operationalising clutch performance.

Research to date has primarily used objective performance indicators to assess clutch performance (see Schweickle et al., 2020 for a systematic review; Study 1), however the specific indicators which most validly represent clutch performance remain unclear. For example, archival studies have assessed clutch performance using outcome-based indicators (e.g., match winning percentage; Jetter & Walker, 2015), performance-based indicators (e.g., total points won, serves, returns; Kovalchik & Reid,

2017), or in some instances, a combination of both (e.g., team win percentage, individual batting averages; Otten & Barrett, 2013). This heterogeneity reflects a lack of definitional clarity over whether a successful outcome (i.e., winning) is necessary for clutch performance. Further, even when only examining the performance itself, it is difficult to determine which indicators should be used. For example, Solomonov et al. (2015) reported that in the NBA, “clutch players” improved their performance in the final 5-minutes of important, close games. This improvement, however, was only demonstrated in statistical indicators of effort, such as field goal attempts, fouls drawn, and points, rather than indicators of skill, such as field goal percentage. Indeed, this finding raises the question of whether indicators of effort, skill, or a combination of both, constitute a clutch performance. As such, confusion exists within the field over how best to operationalise clutch performance as an objective phenomenon, both in regard to whether clutch performances should be assessed on the outcome or the performance, and further, which specific performance indicators should be used.

Clutch performance has also been assessed on the basis of subjective performance, that is, how well athletes perceived they have performed. The value of subjective reflections for performance assessment has long been highlighted, with McAuley and Tammen (1989) noting that “interpretations of competitive outcomes must be considered from the actor’s perspective” (p. 91). Previous qualitative studies have primarily focused on the experiential elements of self-identified clutch performances. For example, Swann et al. (2017a, 2017b) reported that the psychological state underlying clutch performance included deliberate focus, heightened awareness, and increased effort. Schweickle et al. (2021; Study 2), meanwhile, suggested that during episodes of clutch performance, positive perceptions of performance may reduce the appraisal of pressure, whilst conversely, perceived underperformance may increase

the appraisal of pressure. The focus of qualitative studies, therefore, has largely been on the subjective experience of clutch performances, rather than understanding how an athlete identified if they had a clutch performance, or the types of performance indicators they drew on to assess this.

4.2.2 The Current Study

Understanding how athletes identify if they have had a clutch performance, and specifically, the type of performance indicators they draw on to assess this, is fundamental to developing an athlete-centered, operational definition of clutch performance (Schweickle et al., 2020). Indeed, such a definition provides the foundation from which measurement, theory, and applied interventions can be developed (Wacker, 2004). In an effort to explore the types of objective, and subjective, indicators athletes draw on to assess clutch performance, this study employed a mixed methods multiple case study design. The use of both quantitative (i.e., performance data, screening questionnaire) and qualitative (i.e., interviews, observations) methods allowed for a holistic exploration of both objective, and subjective, indicators of performance. Case studies, meanwhile, offer an in-depth, detailed and comprehensive examination of complex phenomena in real-life contexts (Hodge & Sharp, 2019; Yin, 2014). The sport of basketball was utilised given the availability of performance data, in addition to being able to build on the broader clutch performance literature in the domain of basketball by adopting a novel methodology (see Schweickle et al., 2020; Study 1). As such, the overarching aim of this study was to examine which performance indicators basketballers utilised to assess their own clutch performance, and in doing so, contribute towards the development of a more robust, operational definition of clutch performance.

4.3 Methods

4.3.1 Design and Approach

The current study adopted a mixed methods multiple case study design. Case studies have been defined as “an in-depth exploration from multiple perspectives of the complexity and uniqueness of a *particular* person, group, community, project, policy, programme or system in a bounded context” (emphasis in original, Hodge & Sharp, 2019, p. 63). Despite this focus on uniqueness, conceptual and theoretical inferences can be drawn from the exploration of cases (Flyvberg, 2006). The use of multiple cases, meanwhile, offers the benefit of being able to compare similarities and differences across cases (Baxter & Jack, 2008), whilst also presenting different aspects of the same phenomena of interest (Hodge & Sharp, 2019). A key feature of case studies is the use of multiple sources to explore a phenomenon (Yin, 2014). In using multiple sources, a mixed methods approach was adopted, which allowed for the examination of clutch performance from both objective, and subjective, viewpoints. This approach offered the opportunity to collect richer data than could be achieved utilising one method alone (e.g., Moran et al., 2011).

This study was underpinned by a critical realist approach, which combines a realist ontology (i.e., a ‘real-world’ exists independently of our constructions about it) with a constructivist epistemology (i.e., our knowledge of this world is partial, fallible, and socially constructed) (Maxwell, 2012). The contextually embedded and in-depth study of a small number of cases aligns with principles of critical realism (Easton, 2010; Maxwell, 2012). Moreover, critical realists recognise that no single method of producing data ought to be rejected outright, and further, that the use of multiple data sources may be needed when investigating complex phenomena (Ryba et al., 2020). Accordingly, mixed methods research fits appropriately within a critical realist

philosophy when the use of such methods can increase our understanding of the phenomena of interest (Easton, 2010).

4.3.2 Participants and Bounding of Cases

Participants in this study were three male and one female (M age = 23.5 years, $SD = 2.89$) basketball players competing in the top-tier state competition in Australia. Based on the taxonomy proposed by Swann et al. (2015), all participants were considered semi-elite. Potential clutch performances were explored by pursuing certain criteria which bounded the cases (Yin, 2014). Specifically, participants were recruited if they experienced either: (1) increased objective performance compared to their season average; (2) self-perceived better than usual performance; or (3) increased pressure compared to normal competitive circumstances. Performances which satisfied any one of these criteria, or any combination of these, were suitable for data collection. Further, and in an effort to gain a broader understanding of the construct, self-identification of having a clutch performance was not required to meet the recruitment criteria. Accordingly, the cases were the performances themselves, rather than the participants (e.g., Yin, 2014). This resulted in six cases being drawn from four participants, as two of the participants (Centre; Small Forward) competed in both a semi-final and grand-final over one weekend (hence forth these cases are referred to as Centre #1 and Centre #2; and, Small Forward #1 and Small Forward #2). This sample size is in line with recommendations by Stake (2006), who suggested that the benefits of case studies will be limited if fewer than four cases are selected, or more than 10.

4.3.3 Recruitment and Procedure

Ethical approval was granted by an institutional Human Research Ethics Committee prior to participant recruitment. Potential participants were approached either at training, or remotely via a coach (i.e., email), and provided an overview of the

study. Those who expressed interest were sent a screening questionnaire after performing in games with elevated sources of situational pressure (i.e., finals; Baumeister & Showers, 1986). In addition, the first author observed these performances (either online or in-person) and examined potential participants' performance statistics for the game of interest. Participants who met the inclusion criteria were then invited to participate in an interview. All interviews took place via telephone, were audio recorded, and transcribed verbatim.

4.3.4 Data Collection

Four sources of data were collected: (1) a screening questionnaire; (2) objective performance data; (3) observations; and (4) event-focused interviews (Jackman et al., 2021). The screening questionnaire and objective performance data were used to identify potential participants who met the case criteria. These data, in addition to the observations, were then utilised to develop participant specific probes for the event-focused interviews (Jackman et al., 2021).

4.3.4.1 Screening Questionnaire

The screening questionnaire was used to measure participants' appraisal of pressure and their subjective performance. To assess the appraisal of pressure, participants were provided with a definition of pressure based on Baumeister (1984) and Baumeister and Showers (1986) and asked to respond on a Likert scale ranging from 0 (no pressure) to 10 (the most pressure I've felt in sport). This measure was used as no validated measure of pressure in sport exists⁹. Subjective performance was measured by two questions relating to overall performance ("Overall, how well do you think you performed in this event") and goal achievement ("To what extent did you achieve your

⁹ Psychometric measures of anxiety have typically been used to evaluate clutch performance, an approach which has been criticised on account of confounding distinct concepts (Schweickle et al., 2020, 2021; Studies 1 & 2).

goal on this event?”). Both questions were assessed on a Likert scale ranging from -5 (worse than my normal standard/did not achieve) to 5 (above my normal standard/completely achieved). The inclusion of a measure of goal achievement was because goal pursuit has previously been reported in the occurrence of clutch states (e.g., Swann et al., 2017b). The full screening questionnaire is provided in Appendix I.

4.3.4.2 Objective Performance Data

Participants' performance statistics from case performances were compared against their current season average. Utilising current season averages as a comparison point allowed consistency (as some athletes may have played in other leagues or overseas previously) and also acted as a proxy control of the potential influence of team quality (i.e., performances all took place within the same team). To determine which performance variables to examine, we drew on Solomonov et al. (2015), who asked eleven basketball experts to provide the key statistical indicators of clutch performance. Specifically, these were: points (PTS); field goals attempted (FGA); field goal percentage (FG%); free throw percentage (FT%); and assists (AST)¹⁰. Solomonov et al. (2015) proposed that these indicators reflect both effort (i.e., PTS, FGA, AST) and skill (i.e., FG%, FT%). All measures of effort were divided by minutes played, and accordingly, comparisons of these measures against season average are provided on a per minute basis (e.g., PTS/min). To identify if a participant increased their performance against their season average, each key performance indicator from the case performance was converted to a z statistic (indicator - season average/SD). Performance indicators from the case performance which fell outside of a standard distribution ($z >$

¹⁰ The experts interviewed in Solomonov et al. (2015) also identified fouls drawn as a key metric of clutch performance. However, we did not have these data available, and as such, could not include this metric in the current study.

1) were considered to represent increased (or decreased, in the case of a negative statistic) objective performance.

4.3.4.3 Observations

The first author observed all case performances either in-person or via online streams. Initial observations allowed an understanding of the contextual elements of the game. Performances were then viewed a second time (i.e., online replay) once the participant had agreed to participate in an interview about the performance. The purpose of these secondary observations was to assist in developing a detailed, chronological interview guide based on the participant's involvement in the performance. For example, this included noting the time, score, and location of all objective indicators (e.g., FGA) of the participant's performance. This interview guide is discussed in detail below

4.3.4.4 Event-Focused Interviews

Interviews were utilised to gain an in-depth account of the performance from the participant's perspective. These interviews were conducted as soon as possible after the event, in an effort to retain as much detail and accuracy of the participant's recall of the performance (Jackman et al., 2021). A semi-structured approach was employed to allow participants to elaborate on areas of perceived importance. However, specific probing questions were also developed for each individual participant based on the three other sources of data. An example probing question was "at five minutes into the first quarter, and leading by one point, how much pressure were you feeling before you took the 3-point attempt from the top of the key?". On average, the interviews took place 4 days after the performance ($M = 95.75$ hours, $SD = 22.92$ hours), and lasted 63 minutes ($SD = 7.18$).

Broadly, the interviews were conducted as follows. First, we sought participant understandings of what clutch performance was (e.g., “when you hear the term clutch performance, what does it mean to you”). We then provided participants information with how clutch performance is conceptualised in research, to ensure the interviewer and participant were discussing the same concept. Second, we explored general reflections of the event, in which we drew upon the screening questionnaire in developing specific probes (e.g., “you answered that you felt you performed at your normal level in the screening questionnaire, why was that?”). Third, we conducted an in-depth chronological exploration of participants perceived performance and experience of pressure throughout the event. Specifically, we asked participants to rate their pressure (between 0 and 10) before all objective indicators of performance (e.g., FGA’s). Similarly, we also asked participants to rate their performance up to and including all objective indicators of performance (e.g., “your first involvement was a successful 3-pointer at 8:15 in the first quarter, how would you rate your performance up to and including that shot?”). This quantifying of pressure and subjective performance throughout the interview allowed for the development of chronological performance graphs for each participant (see section 4.4 *Results*). Fourth, and following this chronological explanation, participants were asked again to provide reflections on if they felt this performance classified as a clutch performance or not, and further, explain the reasons underlying this reflection.

4.3.5 Data Analysis

As recommended in multiple case study designs, a two-stage process was taken to data analysis (Stake, 2006). First, a within-case analysis was conducted to become familiar with each individual case. Specifically, a detailed report was developed for each case which comprised: (1) a description of the context of the performance; (2) an

overview of the overall match performance; (3) generation of performance graphs detailing fluctuations in objective performance, subjective performance, and pressure throughout the match; and (4) reflections on if the performance classified as a clutch performance. The full case reports for each case are provided in Appendix J.

Following the development of case reports, a cross-case analysis was conducted (Stake, 2006; Yin, 2014). In line with our critical realist philosophy (e.g., Maxwell, 2012), a reflexive thematic analysis was conducted (Braun & Clarke, 2019a). In developing themes, however, we also integrated other sources of data (e.g., Creswell & Plano Clark, 2007). Specifically, by referring to the within-case analysis (i.e., case reports) when interpreting the interview data, we aimed to go beyond a semantic approach to interpreting the data (i.e., mirroring what the participant said; Braun & Clarke, 2013) by adopting a more critical, analytical, and latent approach to interpreting the data (i.e., examining the participant's performance against their reflections). Of note, thematic analysis has previously been used in case study designs with relatively small sample sizes (e.g., Cedervall & Åberg, 2010).

4.3.6 Validity

Potential threats to validity were protected against by considering the empirical adequacy, ontological plausibility, and practical utility of the research account (Maxwell, 2012; Ronkainen & Wiltshire, 2019). In regard to empirical adequacy, by drawing on mixed methods and triangulating these sources of data, we were able to develop a greater understanding of the same phenomena, whilst protecting against the limitations of using one source of data (i.e., only relying on participants' performance recollections). To establish ontological plausibility, meanwhile, critical friends were utilised through all stages of the project (Smith & McGannon, 2018). Moreover, the development of case reports, which established the context in which cases occurred, as

well as the use of multiple sources of data to compare the subjective claims against (i.e., use of performance data), provided further ontological plausibility. Lastly, the research account offers practical utility by increasing our understanding of how to define and conceptualise clutch performance, which will underlie future efforts to intervene with athletes and promote clutch performances in the real-world.

4.4 Results

The aim of this study was to examine the objective, and subjective, indicators basketballers utilise to assess clutch performance. In response to this aim, within-case and cross-case analyses were conducted. To provide the contextual understanding for the cross-case analysis, brief summaries of each case are provided below, in addition to participants individual performance graphs. Further, the results of the screening questionnaire, in addition to the objective performance data, are provided below in Table 4.1.

Table 4.1*Overview of Case Performance Indicators, and Clutch Performance Identification*

Case	Context	Pressure		Subjective Performance	Goal Attainment	Objective Performance		Self-Identified Clutch Performance
		Normal Match	Case Match			Increased	Decreased	
Power Forward	Won Must-Win Game	5	5	1	5	PTS/min; FG%; FT%		Yes
Centre #1	Won Semi-Final	5	6	-2	5	PTS/min; FGA/min		No
Centre #2	Lost Grand-Final	5	7	3	-5	PTS/min; FG%; AST/min		Yes
Small Forward #1	Won Semi-Final	4	7	1	2	FGA/min	FG%	No
Small Forward #2	Won Grand-Final	4	8	2	5		PTS/min	Yes
Guard	Won Must-Win Game	6	7	-1	3	FGA/min		Partial; had clutch moment

4.4.1 Case Summaries**4.4.1.1 Case 1: Power Forward**

Objectively, Power Forward increased their performance in PTS/min ($z = 2.12$), FG% ($z = 1.36$), and FT%¹¹. In this sense, Power Forward displayed both *increased skilled performance* and *increased effort* (e.g., Solomonov et al., 2015). Subjectively, Power Forward reported that their performance was slightly better than normal, reflecting that: “I played above how I’ve been playing, but I think the level that I played on the weekend is the level that I want to hold myself to in this league”. In regard to clutch performance, Power Forward reflected that overall, it did classify as a clutch performance:

¹¹ As the standard deviation for Power Forward’s season average for FT% was 0, a z score is unavailable

I definitely think some aspects of the game, like the way I came and scored at a good level, and did things at a good level, was definitely a clutch performance for me... the change of coming in, and like you said, a spike in scoring, a spike in stats, was definitely a clutch performance in that game.

Inherent in this reflection is that objective indicators play a role in assessing clutch performance, especially during the period in which Power Forward performed notably above their average (see Figure 4.1). Indeed, Power Forward primarily put their poor performance towards the end of the game down to a lack of pressure, and knowing that they would win:

I just kind of got to the end of the game, I kind of knew I was going to get subbed out because we were putting all our guys who didn't play a lot on at the end, I was just kind of getting lazy, like I just was, probably wasn't taking the best shots... we're still winning, we're going to win. I was kind of a bit lazy.

Figure 4.1. Chronological Psychological Experience and Objective Performance for

Case 1

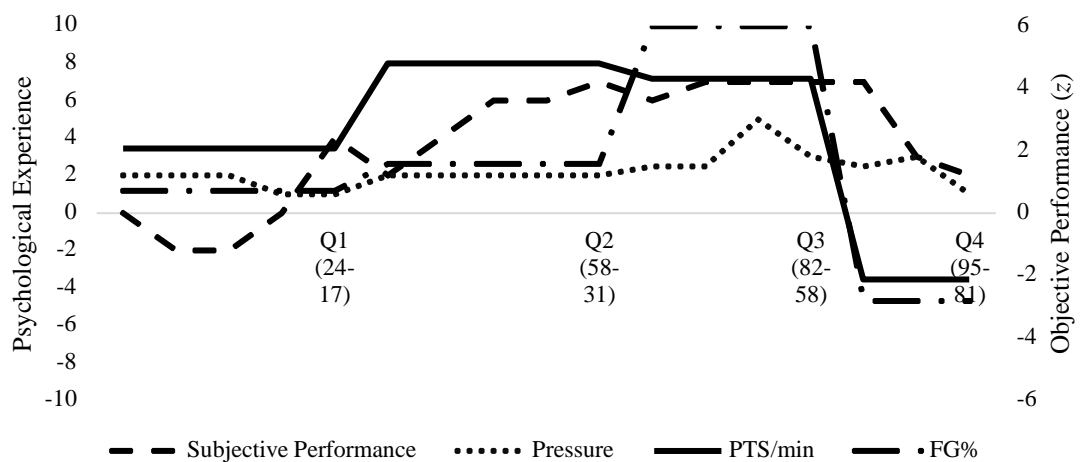


Figure 4.1. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

4.4.1.2 Case 2: Centre #1 (Semi-Final)

Objectively, Centre #1 displayed increased performance in both PTS/min ($z = 1.73$) and FGA/min ($z = 1.54$), representing *increased effort* when compared to their season average. Subjectively, Centre #1 reported performing worse than normal, and appeared to draw on objective indicators to assess this:

I got in about the third quarter, missed an easy layup. And after that, it was just like, a bit of a mental block... the last time we versed them, I had 12 rebounds, nine points or something like that. So, you know, definitely not, not up to my standards.

Reflecting on whether they had a clutch performance, Centre #1 reported:

No, I don't think it really was a clutch performance for me, honestly. I didn't really involve myself in, in any sort of specific play, or any type of run during that fourth quarter. So, I can't really say it was a clutch performance.

As such, this case suggests that increased objective performance may not be sufficient to determine clutch performance. As displayed in Figure 4.2, this may be due to the disparity between objective performance indicators and subjective performance reflections.

Figure 4.2. Chronological Psychological Experience and Objective Performance for Case 2

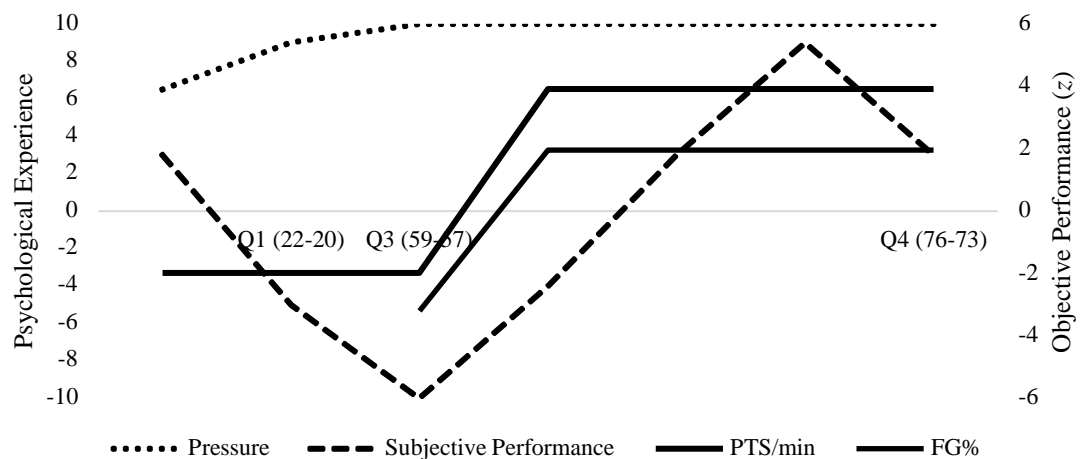


Figure 4.2. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

4.4.1.3 Case 3: Centre #2 (Grand Final)

Centre #2 displayed increased objective performance in both PTS/min ($z = 1.05$), AST/min¹², and FG% ($z = 1.09$). As such, Centre #2 displayed both *increased skilled performance* and *increased effort*. Subjectively, Centre #2 reflected that they performed above their normal standards, and that despite losing the final, this was a clutch performance:

playing the way I did, I felt like I put my team in a position where we could have taken it all. I did everything that I could have done. I definitely can't say that... if I had done more, if I had done this, if I'd done that, we could have won that one. So that, that's clutch for me, you know, doing everything I could have done, to put us in that position to take it all.

Accordingly, this case suggests that one may have a clutch performance in the absence of achieving an objective outcome goal, such as winning. Of note, when reflecting on their clutch performance, Centre #2 highlighted that subjective indicators were of higher value than objective indicators:

It's more about the intangibles. Things that don't show up, basically, but you know, they help the team win... if there's a loose ball, he's going to die for it... he's going to knuckle down... he's going to hustle his heart out to get that offensive board... So that's basically how I... assess myself, yeah... Things that won't show up on the stat sheet but other teams, other players, other coaches, they look at and go, [expletive], I want that guy on my team.

¹² As the standard deviation for Centre #2's season average for AST/min was 0, a z score is unavailable.

Figure 4.3. Chronological Psychological Experience and Objective Performance for

Case 3

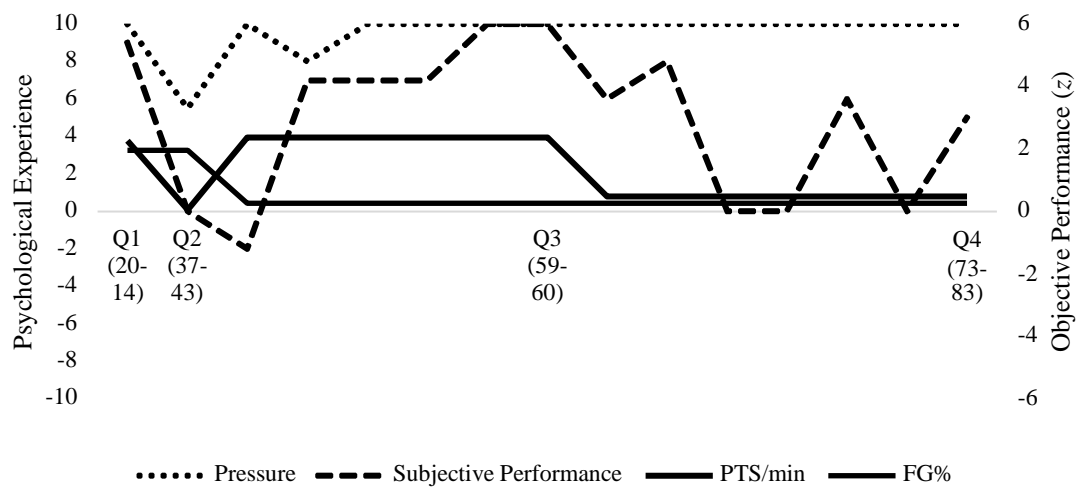


Figure 4.3. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

4.4.3.4 Case 4: *Small Forward #1 (Semi-Final)*

Small Forward #1 demonstrated increased FGA ($z = 2.50$), yet decreased FG% ($z = -1.21$) for this performance. Objectively, this performance may be characterised as *increased effort yet decreased skilled performance* compared to normal. Subjectively, Small Forward #1 reported performing slightly better than normal, which was driven by a recognition of the opposition and winning the match: “[the opposition team] did such a good job of trying to disrupt our style of play, but at the end of the day, I think experience sort of prevailed.” In regard to clutch performance, Small Forward #1 reflected: “Definitely not clutch... it wasn’t a great performance overall. Yeah, I don’t even really think, there’s nothing really like in my mind in terms of anything standing out from the game... just a grind, I think.” This case suggests that increased subjective performance may not be sufficient to assess clutch performance. Indeed, Small Forward #1 appeared to draw on their offensive performance to assess clutch performance,

(“offensively, I kind...thought I let myself down”), which as demonstrated in Figure 4.4, decreased throughout the match.

Figure 4.4. Chronological Psychological Experience and Objective Performance for Case 4

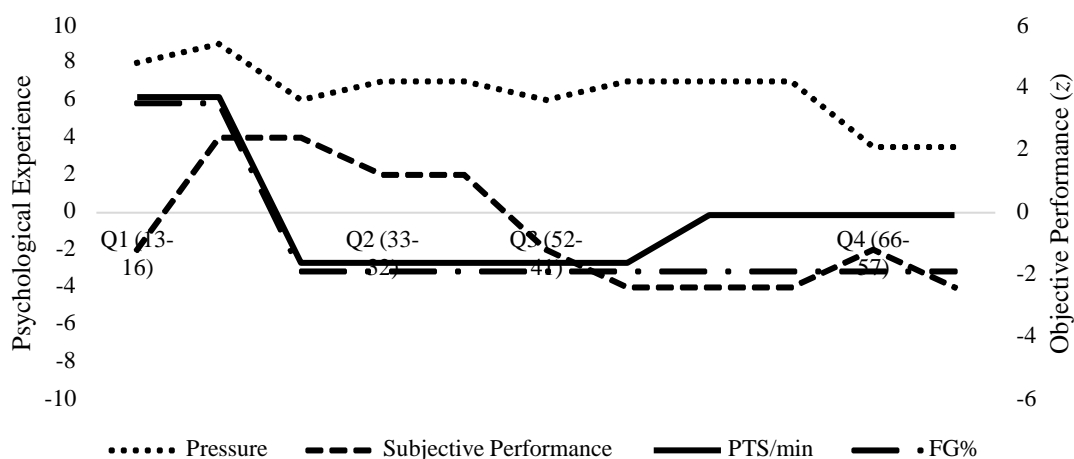


Figure 4.4. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

4.4.1.5 Case 5: Small Forward #2 (Grand Final)

Objectively, Small Forward #2’s performance in the grand final demonstrated *decreased indicators of effort*, with decreased PTS/min ($z = -1.14$) compared to their season average. Subjectively, however, Small Forward #2 rated the performance positively (and higher than the semi-final), largely on account of a sense of contributing to the performance in other ways besides shooting: “[the coach] leaving me in, and he put me in quickly. And so, I must be doing something right. I must just be like, doing things that maybe aren't showing on the stats and that kind of thing”. Small Forward #2 reflected that this was a clutch performance, largely on account of intangible factors:

definitely not stats wise, but little things that contribute to the overall tone of the game. So, I think for me, I had a more clutch performance, um, just in terms of being level-headed and showing experience, and yeah, that kind of thing... I

mean, I can tell, when like [the coach] puts me on a bit more, I must be doing something right.

Small Forward #2's positive appraisal of their performance is displayed in Figure 4.5, in which despite never performing objectively above their season average, and at times below their average, subjective performance remained positive for the entire match. As such, this case suggests objective indicators alone may not be sufficient for determining clutch performance.

Figure 4.5. Chronological Psychological Experience and Objective Performance for

Case 5

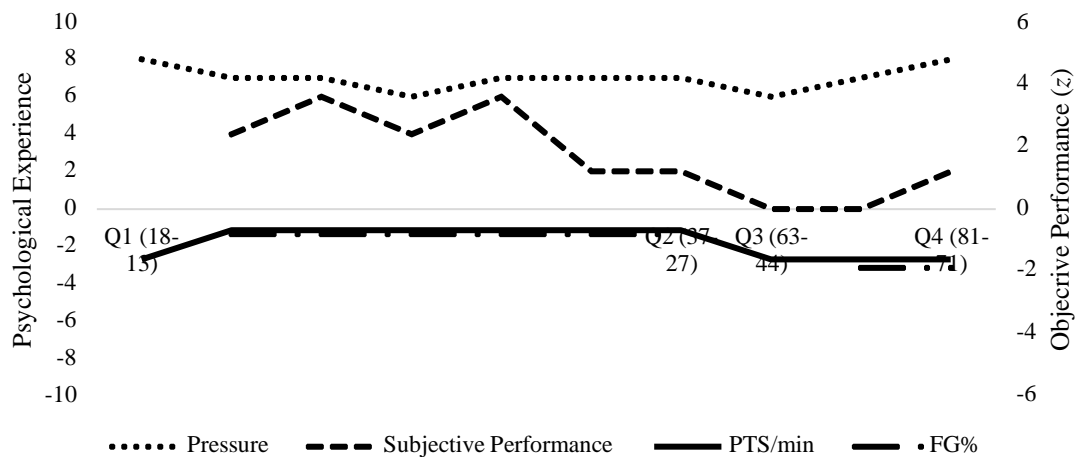


Figure 4.5. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

4.4.1.6 Case 6: Guard

Guard displayed increased FGA/min ($z = 1.57$). Accordingly, Guard displayed an indicator of *increased effort* compared to normal. Subjectively, Guard reported performing slightly worse than normal. This reflection was primarily driven by a sense of underperforming in the first, and fourth, quarters of the match. Reflecting on whether they had a clutch performance, Guard was conflicted:

I wouldn't really say clutch because I think towards the end of the game is where you really define clutchness, and I didn't have that end of game, you know, impact that I would have wanted. But I guess, when I was scoring like that, when I went on that like third quarter, like scoring spree, that would probably by my, you know, definition of my clutchness, because we did need those points.

Indeed, it appears the case that Guard had a *clutch moment* (during the third quarter – see Figure 4.6), rather than an overall clutch performance. This case, therefore, suggests that having a clutch moment may not be indicative of an overall clutch performance, indicating that these may be separate phenomena. Guard's reflection on their psychological state at the end of the match, when under high pressure, supports this distinction:

I definitely would rate my performance, it drops down pretty low at the end of the game... every time I get it, I try to give it to [teammate], who is our best player, instead of actually trying to do it myself... like just let him do it, make all the big shots... whereas sometimes [teammate] will say “nah, nah, you take it”. Which, I guess, you know, I wouldn't classify myself as a clutch player.

Figure 4.6. Chronological Psychological Experience and Objective Performance for Case 6.

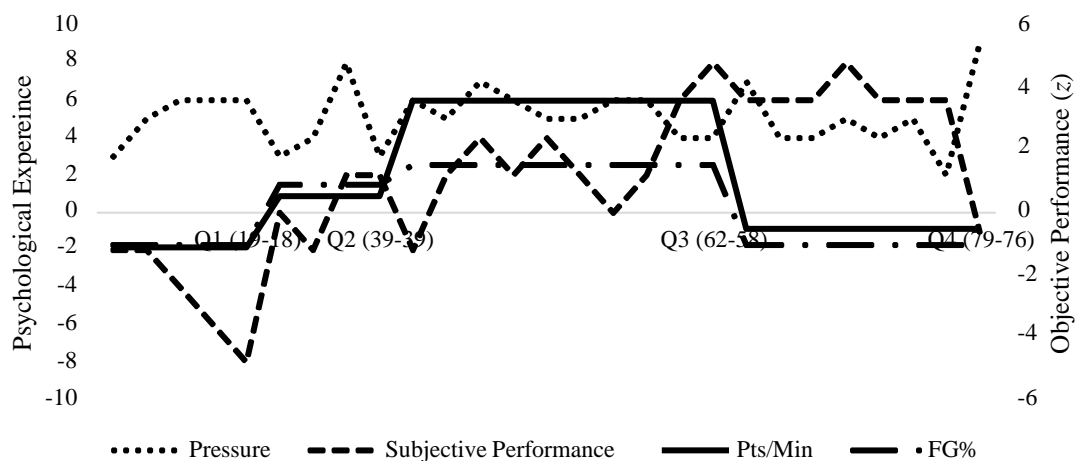


Figure 4.6. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

4.4.2 Cross-Case Analysis

4.4.2.1 *Clutch Performance may be Assessed Using Both Objective, and Subjective, Indicators*

Participants reflected that they drew on both objective, and subjective, indicators of performance when evaluating if they had a clutch performance. As reflected in the individual cases, *objective indicators*, such as scoring statistics, appear an important barometer in the context of basketball to assess clutch performance. Indeed, participants demonstrated an awareness of their own statistics, both in regard to indicators of effort (Centre #2: “my season average was like four or five points per game, and then playing in that game [case performance], I had 11 points”) and indicators of skilled performance (Guard: “I think I ended up with five out of 14 for my shooting”). Participants also reported that *pressure influences the assessment of objective indicators of performance*. Specifically, it appeared that successful performance during periods of increased pressure appraisal had a positive influence (Guard: “the pressure was definitely really high on that one, but once it actually went in, I’d say my perception of performance went up”), whilst unsuccessful performance appeared to have a negative influence on perceived performance (Centre #1: “I put a lot of pressure on myself when I’m wide open. And if I don’t get to make that shot, I get really down on myself”). Further, *situational factors influenced the assessment of objective indicators of performance*. For example, factors such as the opposing player and the situational context of the game (Power Forward: “First shot off the bench is always a bit of a loosen up again... it’s a bonus if it goes in”), all influenced how participants assessed their performance in relation to objective indicators. As such, whilst objective indicators play an influential

role in assessing clutch performance, these indicators may also be interpreted through a subjective lens.

A number of participants also reported drawing on *intangible* factors to assess clutch performance, and in one case, clutch performance was reported in the absence of any increased objective performance indicator (i.e., Case 5: Small Forward #2). For example, participants drew on factors such as decision making, perceived effort, and perceived control in assessing their performance. Importantly, it does not appear that participants drew on either objective, or subjective, performance indicators; rather, both appeared to play an important role in assessing clutch performance: “The energy I bring on the court. That sort of stuff. It's both on the stats, and what I do that doesn't show up, the intangibles type of thing” (Centre #1). As such, both objective, and subjective, performance indicators may be considered when assessing clutch performance.

4.4.2.2 Clutch Performance is About Contributing; Not Winning

When assessing clutch performance, participants appeared to draw on their perception of *contributing to the performance*, rather than necessarily winning the contest. In some cases, objective indicators provided an indication of contribution: “just the fact that I was scoring, I felt like I was helping out the team” (Guard). Meanwhile, there were also subjective elements that provided a sense of contribution: “definitely not stats wise, but little things that contribute to the overall tone of the game” (Small Forward #2). As encapsulated by Power Forward, how such contribution is assessed may be contextually based:

just knowing that I did everything I could in the game, maybe one day I only have a small game on the stat sheet, but I do a lot of other things that don't show up on the box score. Just doing the things that the team needs to win. If it's me shooting the ball a lot, and scoring this week, but this Saturday it may be

rebounding and doing other things, I'm happy, I'm happy to do that if that's what it takes to win.

As such, participants appeared to consider how they contributed to the overall performance when assessing their clutch performance, which may have been informed by objective, or subjective, indicators.

Whilst the majority of cases in which clutch performance was reported won their match, in one instance (Case 3: Centre #2), clutch performance was reported despite losing the match. This case provides an indication that *clutch performance may not be evaluated on the outcome*. Centre #2 reflected on this in relation to assessing goal achievement for their clutch performance:

This is my first time I've had to experience that. So, I don't have any personal goals. Actually, my personal goal is just to play the best that I can. That's all I can ask. So, in that sense, I guess that was a five out of five, because I did that goal. I played the best I could, I know I put my heart out and put everything on the line. But, in terms of superficial, like, winning the whole thing, definitely not. Minus five.

Evident in this quote is that Centre #2 did not assess their clutch performance based on the outcome, but rather, their own performance.

4.5 Discussion

The aim of this study was to explore the type of performance indicators that basketballers used to identify clutch performance. Utilising a mixed methods multiple case study design, it was found that clutch performance may be assessed using both objective, and subjective, performance indicators. Specifically, whilst increased objective performance may not be necessary, nor sufficient, for clutch performance, objective indicators still play an important role in shaping subjective performance

reflections. Further, such objective indicators were often interpreted through a subjective lens, in that the same indicators (e.g., field goal) may be assessed differently based on the appraisal of pressure or situational context. Importantly, athletes draw on both of these indicators when evaluating their contribution to the team's performance, which appeared important when identifying clutch performance. Lastly, athletes reported considering clutch performance based on performance-based indicators, rather than the outcome. These findings, and their conceptual and applied implications, are discussed below.

4.5.1 How Do Athletes Identify Clutch Performance?

When identifying clutch performance, athletes draw on both objective, and subjective, indicators of performance. Predominately, clutch performance has been assessed using objective performance indicators (e.g., Otten & Barrett, 2013). Findings from the current study, however, suggest that whilst objective indicators are important in assessing clutch performance, these indicators are often viewed through a subjective lens. That is, factors such as perceived pressure or the situational context may influence how an athlete assesses an objective performance indicator, such as a successful field goal. Whilst previous literature has demonstrated that pressure may influence performance in facilitative or debilitating ways (e.g., Schweickle et al., 2021; Study 2), these findings suggest that pressure may also influence how performance is actually appraised. Subjective factors such as decision making and perceived control, meanwhile, were also reported as important considerations when determining clutch performance. Indeed, the difficulty of capturing such factors using performance statistics alone highlights the importance of examining athletes' perspectives when exploring clutch performance (e.g., McAuley & Tammen, 1989). As such, assessments of clutch performance must look beyond only using objective indicators (i.e., archival

designs), as the interpretation of these indicators may change depending on the athletes' context, whilst subjective indicators (e.g., perceived control) appear to also play a crucial role in evaluating clutch performance.

4.5.2 Conditions for Clutch Performance

Increased objective performance may be neither necessary, nor sufficient, for clutch performance. First, clutch performance was reported in the absence of increased objective performance (i.e., Case 5). In this instance, subjective indicators, such as decision making, were primarily drawn upon to identify clutch performance. Accordingly, it appears that increased objective performance is not a necessary condition (i.e., a requirement) for clutch performance (Brennan, 2017). Second, clutch performance was reported in the absence of an objective outcome, such as winning. Specifically, Case 3 reported experiencing a clutch performance despite losing a grand-final. As such, achieving an objective, outcome-related criteria may not be necessary for clutch performance (Brennan, 2017). This finding contrasts Hibbs' (2010) delineation that to be classified as a clutch performance, the performance must have a significant impact on the outcome of the contest. As such, it may be the case that Hibbs' (2010) definition of clutch performance does not reflect athletes' experience of this phenomena, and hence may require refinement (Bunge, 2009; Laas, 2017). Lastly, increased objective performance may not be sufficient for clutch performance. Despite displaying increased objective performance indicators (i.e., PTS/min), Case 2 did not report clutch performance. As such, it may be the case that even when an athlete displays increased objective performance, they do not report clutch performance, meaning that this is not a sufficient condition for clutch performances to occur (Brennan, 2017). Conceptualisations of clutch performance should therefore consider

that objective performance indicators appear neither necessary, nor sufficient, for self-reported clutch performances.

Perceptions of improved performance compared to normal (i.e., increased subjective performance) may not be sufficient for clutch performance. Specifically, despite reporting better than usual subjective performance, Case 4 did not report clutch performance. As such, it may be that even when one feels they have performed better than average under pressure, they do not report clutch performance. Given that objective performance also appears neither sufficient (nor necessary) for clutch performance, this finding is noteworthy. Specifically, it may be the case that subjective performance is too broad a term to accurately reflect the performance requirements for clutch performance. For example, it was evident that the participants drew on a range of factors to assess their own subjective performance, and that the importance placed behind specific indicators differed between-cases (see Appendix J). Accordingly, whilst the current findings do suggest that subjective reflections are crucial to evaluating clutch performance, it does not appear sufficient to solely assess clutch performance based on a simple assessment of subjective performance.

4.5.3 Future Directions

To develop this line of research further and continue to refine the concept of clutch performance, two recommendations are provided. First, athlete reflections must be considered when assessing clutch performance. Whilst there may be a reluctance to consider performance at a subjective level, given the availability of performance data and tradition of archival research in this field (e.g., Cramer, 1977), the current findings suggest that such subjective elements are crucial in determining clutch performance. Indeed, given that clutch performance is a psychological construct (Otten, 2013), and that direct measurement of pressure is recommended (Schweickle et al., 2021; Study 2),

examining athletes' performance reflections should not present a barrier to measurement. Second, greater clarity surrounding the relationship between subjective performance and clutch performance is required. Indeed, it may be the case that only certain aspects of subjective performance, such as goal achievement (Swann et al., 2017b) or meeting expectations (Schweickle et al., 2021; Study 2), are necessary or sufficient for clutch performance, whereas overall improved subjective performance may not be. Efforts to continue to elucidate the specific conditions required for clutch performance is critical for the development of measures and applied interventions moving forward.

4.5.4 Applied Implications

The current study provides a number of implications for applied practitioners and researchers. When assessing performance, practitioners should consider that athletes' do not appear to judge all objective indicators of performance equally, nor consistently. That is, factors such as the appraisal of pressure and the situational context may impact how athletes assess their performance. Further, athletes appear to judge their clutch performances based on the performance itself, rather than the outcome. Indeed, it may be the case that clutch performance occurs without an increase in objective performance indicators. When working with athletes, therefore, practitioners should consider how they conduct performance evaluations, which may require looking beyond statistics or outcome-based measures and considering the athlete's own interpretations of their performance. Meanwhile, in developing interventions to facilitate clutch performance, researchers should consider how to assess performance. For example, measures may need to be introduced which can capture subjective indicators of performance, such as perceived effort or control, in addition to

performance statistics. In sum, applied practitioners and researchers should recognise, and consider, the subjective component of assessing performance under pressure.

4.5.5 Limitations

This study contained a number of limitations. First, the measures utilised in the screening questionnaire were not validated. To the authors' knowledge, no validated measure of pressure, nor subjective performance, exist within the literature. Whilst the decision to develop our own measures of pressure and subjective performance for the purpose of screening participants was therefore somewhat unavoidable, it remains these are preliminary measures which are not validated. Future research should endeavour to develop a robust, validated measure of pressure, subjective performance, and clutch performance. Second, this study took place in the context of a single sport (i.e., basketball). It may be the case that how objective indicators are interpreted differs between sports. For example, less fluid sports with more objective feedback (e.g., weightlifting) may be assessed differently to more fluid sports with less objective feedback (e.g., rugby). Third, all participants in the current study were semi-elite (Swann et al., 2015). It may be that athletes of a higher standard, however, assess performance differently. For example, there may be specific objective indicators of performance that athletes need to achieve to maintain funding (e.g., McKay et al., 2008). As such, future research may consider examining athletes from a broader range of sports and expertise levels.

4.5.6 Conclusion

This study aimed to explore the type of indicators basketballers use to identify clutch performance. These findings indicated that clutch performance may be assessed using both objective, and subjective, indicators of performance. Indeed, it appears that neither objective, nor subjective, performance indicators alone are necessary or

sufficient for identifying clutch performance. Future research should therefore continue to elucidate the relationship between subjective performance and clutch performance, with the aim of specifying which components of subjective performance (i.e., goal achievement, expectations) may be required for clutch performance. Practitioners may benefit from these findings by looking beyond objective or outcome-based measures of clutch performance, and incorporating athletes' interpretations of different performance indicators, as well as considering measurement of subjective indicators, such as perceived effort or control.

Chapter 5: Was it a Clutch Performance? A Qualitative Exploration of the Definitional Boundaries of Clutch Performance

5.1 Foreword

An essential issue discussed in Chapter 2 (Study 1; Schweickle et al., 2020) was whether clutch performance requires an athlete to increase their performance (e.g., Otten, 2009), or whether maintained performance is sufficient (e.g., Hibbs, 2010). Further, Chapter 2 (Study 1; Schweickle et al., 2020) demonstrated that the benchmarks to which researchers have compared clutch performance are inconsistent. Accordingly, the aim of this Chapter (Study 4) was to examine athletes' perceptions of the performance level required for clutch performance, and further, what benchmarks athletes utilised to compare their clutch performances against. In light of the findings reported in Chapter 4 (Study 3), in which subjective indicators of performance were reported as important in identifying clutch performance, this Chapter adopted a qualitative methodology. Of note, data from nine participants within this Chapter were also included in Chapter 3 (Study 2; Schweickle et al., 2021). These participants were included within this Chapter, however, as the research questions were distinctly different, and had not been explored in Chapter 3. Accordingly, data extracts (i.e., quotes) and analyses (i.e., codes, themes) presented in this Chapter were unique, and had not previously been reported. Utilisation of an overlapping dataset to answer different research questions across multiple studies aligns with the analytical approach adopted in both Chapter 3 and this Chapter (see Braun and Clarke (2013) for full discussion). The following research (excluding abstract and reference list) has been submitted to the *Psychology of Sport and Exercise* and reformatted for the thesis.

5.2 Introduction

Clutch performance, broadly defined as improved or successful performance under pressure (Hibbs, 2010; Otten, 2009), has a long history of research (e.g., Cramer, 1977) and media interest (e.g., West & Libby, 1969). The ability to perform under pressure has been suggested to be one of the most important psychological factors in sport (Mesagno & Mullane-Grant, 2010). Indeed, prodigious athletes such as Roger Federer (Higgins, 2018), Cristiano Ronaldo (Parvizi, 2020), and Derek Jeter (Castellano, 2014) are not only renowned for their physical skill, but also their perceived ability to perform when it matters most. In parallel to this interest by the broader sporting community, a recent systematic review highlighted that research into clutch performance has gained significant momentum in the last decade (Schweickle et al., 2020; Study 1).

Despite this growing interest, the concept of clutch performance remains “ambiguously defined” (Mesagno & Hill, 2013a, p. 275) and is “a challenging concept which is inadequately defined in sport” (Seifreid & Papatheodorou, 2010, p. 92). Schweickle et al. (2020; Study 1) highlighted that the use of unclear and inconsistent definitions has resulted in a field of research characterised by methodological and theoretical issues, limiting our understanding of how clutch performances occur. To advance the field of clutch performance, therefore, it is important to consider how definitions of clutch performance may be refined to provide a robust foundation for measurement and theoretical development (Bunge, 2009; Cooper et al., 2001). A fundamental avenue for such definitional elucidation is exploration of the performance level required for clutch performance (i.e., do clutch performances involve increased, or maintained, performance?), and further, the benchmarks clutch performances should be compared to (e.g., one’s previous performance, season average, or even career average;

Schweickle et al., 2020; Study 1). Accordingly, the aims of the current study were to explore athletes' perceptions of: (1) the performance level required for clutch performances; and (2) the performance benchmarks that clutch performances are compared against.

5.2.1 Is Performance Increased or Maintained?

Current approaches to defining clutch performance differ on what performance threshold is required for clutch performance. Otten (2009) specified that clutch performance is “any performance increment or superior performance that occurs under pressure circumstances” (p. 584). As such, Otten’s (2009) definition requires that athletes increase their performance level to be classified as a clutch performance. In contrast, Hibbs (2010) defined a clutch performance as when “a competitor manages to perform in accordance with their ability despite the pressure associated with the circumstances” (p. 56), and further, that this performance has “a significant impact on the outcome of the contest” (p. 48). According to Hibbs (2010), therefore, maintained performance is sufficient for clutch performance, although this performance must have a bearing on the outcome. In sum, the two primary definitions of clutch performance diverge on what performance level is required to classify a clutch performance, and further, whether clutch performances must have an impact on the outcome of a competition.

The performance level required for clutch performance has meaningful measurement and theoretical implications. Archival research, which has primarily focused on whether clutch performers (i.e., athletes delivering repeated clutch performances) exist within sports such as baseball (e.g., Birnbaum, 2008), basketball (e.g., Wallace et al., 2013), and tennis (e.g., Jetter & Walker, 2015), has demonstrated little statistical support for this claim (Schweickle et al., 2020; Study 1). For example,

Wallace et al. (2013) concluded that “most of the remaining players are, in a statistical sense, average in that their performances do not rise or elevate as playoff games enter the so-called ‘clutch’ time” (p. 646). However, if one were to apply Hibbs’ (2010) definition of clutch performance of maintained, rather than increased, performance, the conclusions regarding the existence of clutch performers would likely differ. This example, drawn from archival research, in which under one definition clutch performers do not exist (e.g., Otten, 2009), yet under another they may (e.g., Hibbs, 2010), serves to highlight the impact different definitional conditions has on our understanding of this phenomenon. Further, this definitional inconsistency has inhibited theoretical development in the field of clutch performance. At present, there is no specific theory of clutch performance (Schweickle et al., 2020; Study 1). Indeed, any theoretical explanation requires clarity on what is being predicted (i.e., increased, or maintained, performance; Cunningham, 2013; Sutton & Staw, 1995). To contribute to both measurement and theoretical development, therefore, definitional clarity on what performance level is necessary for clutch performance is required.

5.2.2 What is a Clutch Performance Compared Against?

When assessing whether a performance has increased, or has been maintained, it is necessary to compare the performance of interest against some benchmark. No definitions of clutch performance, however, stipulate what this benchmark should be, and accordingly, a wide range of approaches have been adopted in the literature. For example, archival studies have assessed potential clutch performances against a range of performance benchmarks across different sports, including: career averages (e.g., Jetter & Walker, 2015); previous season performance (e.g., Birnbaum, 2008); same season performance (e.g., Otten & Barrett, 2013); projected performance (e.g., Deane & Palmer, 2006); performance within the same game (e.g., Wallace et al., 2013); and, both

the performer's and teammates' performance within the same game (e.g., Solomonov et al., 2015). Such heterogeneity not only makes it difficult to compare results across studies, but also highlights the confusion surrounding what benchmark potential clutch performances should be compared against.

Previous qualitative research has focused on the characteristics of clutch performance episodes, rather than exploring why athletes consider such episodes as a clutch performance. For example, Hill and Hemmings (2015) and Hill et al. (2017) both asked athletes to identify a clutch performance, yet it is unclear what benchmark these athletes compared their clutch performance against, and further, what criteria they used to assess their performance (i.e., was it based on the outcome, or the performance?). Similarly, Swann et al. (2017a, 2017b, 2019) examined the concept of clutch states (i.e., the psychological state purported to underlie clutch performances; Swann et al., 2019). Whilst findings were reported surrounding how such states occur (e.g., challenge appraisal, pursuing specific goals) and the characteristics underlying such states (e.g., intense effort, exerting control), investigations conducted by Swann et al. (2017a, 2017b, 2019) focused on the subjective experience of clutch performances, rather than how such performances were assessed and identified by the individual athletes and exercisers. In attempting to elucidate the concept of clutch performance, however, such questions are important to explore. Specifically, understanding how athletes assess clutch performance provides an important step towards generating a theory of clutch performance, which may ultimately underlie applied efforts to facilitate clutch performance.

5.2.3 The Current Study

The aims of the current study were to explore athletes' perceptions of what performance level constitutes a clutch performance, and further, what such

performances are compared against. To explore these aims, a qualitative, event-focused approach was adopted. Specifically, this approach involved interviewing athletes as soon as possible after a successful performance under pressure, in an effort to maximise the detail and accuracy of the athletes' recall of their own performance, and how they assessed it (Jackman et al., 2021). A qualitative approach was chosen to allow for an in-depth exploration of athletes' views of what clutch performance is. Indeed, it is important that a definition reflects the views of those affected by said definition (Laas, 2017). That is, if researchers seek to observe, classify, and understand clutch performances, it is important that the definition of clutch performance considers athletes' understandings of what the concept means. Moreover, an athlete-centered definition is central to developing theory-based, applied interventions which are matched to the athletes' needs (Mesagno & Hill, 2013b). Ultimately, this study endeavored to provide clarity on how clutch performance should be assessed, and in doing so, contribute towards calls for a refined definition of clutch performance (Schweickle et al., 2020; Study 1).

5.3 Methods

5.3.1 Philosophical Approach and Researcher Positioning

This study adopted a critical realist approach to understanding how athletes assessed their own performance under pressure. This approach draws on a realist ontology, which assumes an external world independent of human perception (Danermark et al., 2002), and a constructivist epistemology, which proposes that our knowledge of this external world is socially determined (Danermark et al., 2002). Accordingly, there is an acceptance that there is no possibility of attaining a single and independent understanding of the world, but rather, there may be different perspectives on reality (Maxwell, 2012). Underlying critical realism is the assumption that mental

phenomena are both real, and fundamentally involved in the causal processes that produce behaviour (House, 1991). Qualitative methods allow for an in-depth exploration of such mental phenomena, and further, how individuals understand and perceive such phenomena (Maxwell, 2012).

An important tenet of qualitative research is an acknowledgment that researchers bring their own assumptions and beliefs to a study. Thus, it is important to be mindful of such preconceptions. In this instance, all members of the research team had previously published qualitative research in the area of clutch performance, drawing on a critical realist approach (Schweickle et al., 2021; Study 2). As such, the research team's understanding of clutch performance has largely been influenced by qualitative approaches, and further, stems from an understanding of this topic, and approaches to research, from a Western cultural context. Of equal importance, however, is that researchers actively engage in a process of critically reflecting on the knowledge produced (i.e., reflexivity; Braun & Clarke, 2013). Given their qualitative experience and conceptual knowledge, the second and third authors were both involved in providing feedback on all stages of the study. Specifically, this also involved challenging the first author's interpretation of the data and generation of themes (see *Validity*). Our critical realist philosophy also influenced other components of the study, including the approach taken to data collection, analysis, and assessment of validity. The alignment of these approaches with critical realism is explained in the relevant sections below.

5.3.2 Participants

Participants in this study were 24 athletes (19 male, 5 female) who had objectively, or subjectively, performed successfully under pressure in a recent sporting

event¹³. These participants ($M_{\text{age}} = 27.13$, $SD = 5.78$) were from Australia ($n = 22$), New Zealand ($n = 1$), and Ireland ($n = 1$). The sports they participated in were: football (soccer, $n = 6$); rugby union ($n = 4$); rugby sevens ($n = 4$); half-marathon running ($n = 2$); rugby league ($n = 2$); 5000 metre running ($n = 1$); golf ($n = 1$); basketball ($n = 1$); camogie (i.e., popular Irish stick-and-ball game played by women; $n = 1$); triathlon ($n = 1$); and submission grappling ($n = 1$). Participants ranged from competitive-elite (e.g., regularly competing in a top-tier league, or at international competitions) to recreational (Swann et al., 2015). Recreational athletes were included within the current study given both the subjective nature of appraising pressure (e.g., Baumeister, 1984), and previous research which has suggested clutch performances may be experienced in recreational athletes and exercisers (Schweickle et al., 2021; Study 2; Swann et al., 2017b, 2019). Participants' expertise and their sampling rationale are provided in Appendix K. Participants were interviewed on average four days after the event ($M = 93.08$ hours, $SD = 43.18$ hours), with interviews ranging from one day to eight days after the event. On average, interviews lasted 46.29 minutes ($SD = 11.26$ minutes).

5.3.3 Sampling and Recruitment

Critical realism emphasises the role of context in understanding mental phenomena (Maxwell, 2012; Pawson & Tilley, 1997). Accordingly, we sought athletes from a range of standards and sports to explore the potential role of context in the assessment and evaluation of clutch performance. Participants were purposively sampled if they either reported subjectively good performance, or performed objectively

¹³ Data from nine participants were also included in a previously published study (Schweickle et al., 2021; Study 2). These participants were included in the current study, however, as the research questions were distinctly different, and had not been explored in the previously published study. Accordingly, data extracts (i.e., quotes) and analysis (i.e., codes, themes) presented in the current study were unique, and had not previously been reported. Utilisation of an overlapping dataset to answer different research questions across multiple studies aligns with our analytical approach (see Braun and Clarke (2013) for full discussion).

well (e.g., a high-place finish), under pressure (Palinkas et al., 2015). This dual sampling strategy was used as questions remain over what performance criteria should be used to determine clutch performance (i.e., if clutch performance should be subjectively, or objectively, assessed; Schweickle et al., 2020; Study 1). Further, this criterion related to overall performance within the event, rather than performance during a specific moment (fluctuations in performance and pressure throughout the event, however, were explored within the interview; Schweickle et al., 2021; Study 2). In an effort to reduce overlooking participants with relevant performances who were either unfamiliar with the term or carried preconceived notions of what the term meant (i.e., a match-winning shot), we intentionally avoided asking participants if they had a clutch performance in the recruitment stage (this was, however, explored in the interview). We did, however, ask potential participants if they had experienced pressure in the event when recruiting, to ensure they met the recruitment criteria (e.g., Schweickle et al., 2021; Study 2).

The recruitment strategy involved two approaches. Firstly, the first author attended sporting events likely to have involved increased sources of situational pressure (e.g., finals, knockout competitions, important round games; Baumeister & Showers, 1986). Following the event, potential participants were approached, introduced to the research project, and asked if they would be interested in taking part in an interview. Twelve participants were recruited this way. Secondly, snowball sampling was utilised in instances where the research team were made aware of a potentially relevant performance that met the criteria through personal contacts. In these instances, the first author followed up with the potential participant to confirm that the performance met the recruitment criteria, and if so, invited the performer to participate in the study. Twelve participants were recruited in this manner.

5.3.4 Procedure

Ethical approval was granted for the study by a university ethics committee prior to commencement. Two interviews were conducted in person, with the remaining interviews conducted via Zoom software online ($n = 3$) or via telephone ($n = 19$). The use of primarily remote interview methods reflected the aim to collect data as soon as possible, provide convenience to the participants, and that 14 interviews were conducted during the COVID-19 pandemic. In response to the potential drawbacks of telephone interviews (e.g., Holt, 2010), a rapport-building process was implemented in both face to face and remote interviews. Specifically, this included introducing the project and the interviewer's background, ensuring the participant felt they had the opportunity to ask questions and challenge interviewer assumptions, and scheduling interviews at a time that was of most convenience to the participant (DiCicco-Bloom & Crabtree, 2006). Further, the third author provided feedback on several initial interviews, including the extent of rapport developed during the interview. In all such cases, the feedback provided by the third author indicated that the rapport-building process has been successfully implemented. An information sheet and consent form were provided to participants prior to the interview, and consent obtained before the interview took place. All interviews were audio recorded and transcribed verbatim.

In deciding an appropriate sample size, we were guided by the concept of information power (Malterud et al., 2016). Specifically, the concept of information power was utilised given our epistemological constructivism and reflexive approach to analysis (e.g., Braun & Clarke, 2019a), in which concepts such as data saturation may not be appropriate (Braun & Clarke, 2019b). The concept of information power is based on the premise that the larger information power a sample holds, the lower the sample size that is needed, and vice versa. In considering sample size, one must examine five

facets: (1) the aims of the study; (2) sample specificity; (3) the use of theory; (4) the quality of dialogue; and, (5) the analysis strategy (Malterud et al., 2016). For the current study, it was determined by the research team that the study aims were narrow, the data contained strong quality of dialogue (on account of the first author's expertise in the area and previous experience in conducting event-focused interviews), existing concepts could be drawn on (e.g., definitions of clutch performance), and the sample specificity was dense (as all participants belonged to our specified target group). These sample strengths were weighed against using a cross-case analysis, which may increase sample size requirements. Accordingly, we deemed 24 participants to be an appropriate sample size to meet the aims of the current study. Of note, our sample size exceeds other studies adopting event-focused methods (Swann et al., 2017a) as well as minimum recommendations for thematic analysis (e.g., Braun et al., 2019)

5.3.5 Interview Schedule

A semi-structured, event-focused interview approach was utilised (Jackman et al., 2021). Interviews incorporated an open-ended approach to allow new discussions to occur, but also focused on interviewing the participant regarding performance in a single event (e.g., a finals game). In this way, the interview also included specific probing questions which were used, where necessary, to guide the interview and gain further insight. Event-focused interviews attempt to obtain detailed contextual data and chronological insights into participants' experiences and perspectives (Jackman et al., 2021). Indeed, the retention of as much contextual information as possible aligns with our critical realist philosophy, which views the context in which phenomena occurs as paramount to understanding the phenomena itself (Maxwell, 2012). All interviews were conducted by the first author, who had previously conducted event-focused, semi-structured interviews (Schweickle et al., 2021; Study 2). Specifically, the interview

addressed: (i) general understandings of the concept of clutch performance and performance under pressure (e.g., “what does clutch performance mean to you”); (ii) overall reflections of their performance in the event (e.g., “why did you say that you performed well in this event”); (iii) chronological recall of the event (e.g., “from start to finish, describe any periods where you thought you were performing well, and why”); and, (iv) exploration of how the participant judged and assessed the event after completion (e.g., “when you say you performed well in this event, what are you basing that on, and what are you comparing it against?”). In discussing clutch performance, a common terminology and understanding of the concept was required between the interviewer and participant. Following exploration of the participants’ familiarity with, and perceptions of, the concept, the interviewer then established that clutch performance broadly referred to positive performance under pressure (e.g., Schweickle et al., 2020; Study 2). The interviewer concluded the interview by providing an overall reflection of the discussion and asking whether anything had been overlooked or misrepresented.

5.3.6 Data Analysis and Validity

A critical realist approach recognises that qualitative interactions are inherently reflexive (e.g., Hammersley & Atkinson, 2007) as researchers bring different values, understandings, and perspectives to a study (Maxwell, 2012). Accordingly, data were analysed using reflexive thematic analysis (Braun & Clarke, 2013, 2019a), which acknowledges the active role researchers play in both engaging with, and interpreting, the data. Following interview transcription, the first author familiarised themselves with the data, by reading and re-reading transcripts. Initial codes were then developed from the data, with each code generated to represent a single idea. These codes were then categorised into themes under a central organising concept. An abductive approach was adopted when generating codes and themes, in that whilst there was a knowledge and

familiarity of theories and concepts from the outset (e.g., definitions of clutch performance), there was an allowance for the generation of new insights and novel ideas that go beyond the initial theoretical and conceptual premises (Danermark et al., 1997; Meyer & Lunnay, 2013). For example, the generation of the theme *clutch performance is assessed against goal achievement* was not noted in previous definitions or conceptualisations of clutch performance, and hence was inductively developed from these data to provide novel insights into how clutch performance may be assessed.

A critical realist account of validity does not relate to a specific procedure or checklist, but rather, how well the accounts and subsequent conclusions helps us understand the phenomena under investigation. Drawing on Maxwell (2012), Ronkainen and Wiltshire (2019) suggest that validity in realist accounts can be established in three ways: (1) empirical adequacy; (2) ontological plausibility; and, (3) practical utility. In regard to empirical adequacy, all interviews were audio recorded, transcribed verbatim, and the transcripts checked for accuracy. Threats to ontological plausibility, meanwhile, were guarded against by drawing on current definitions and understandings of clutch performance, focusing on the specific contexts in which the performances occurred (via event-focused interviews), and exploring alternative explanations of the data by utilising critical friends at all stages of data collection and analysis (e.g., generation of interview guide, code and theme generation). Lastly, whilst the aims of the current study were not specifically directed at applied practice, we believe the results carry strong practical utility. Specifically, the outcomes of the current study are an essential step in refining current definitions of clutch performance, which will underlie future efforts to develop interventions to promote such performances. Whilst these steps were taken to protect against threats to validity, as viewed through a critical realist lens, it is important to acknowledge that such procedures are not unique

to critical realism, and may be used across different paradigms (Smith & McGannon, 2018).

5.4 Results

The aims of this study were to explore athletes' perceptions of what performance level constitutes a clutch performance, and further, what such performances are compared against. In response to these aims, three themes were generated: (1) clutch performance is assessed against goal achievement; (2) clutch performance exists on a performance spectrum; and (3) different benchmarks are used to assess clutch performance. An overview of these themes, the codes from which they were developed, and examples of raw data are provided in Table 5.1 and discussed in detail below.

Table 5.1

Data examples, codes, and themes describing participants' assessment of clutch performance

Data examples	Codes	Themes
It's just being able to achieve those certain goals under pressure, not so much like a game winning thing	Clutch performance is assessed against self-referenced goals rather than outcome goals	Clutch performance is assessed against goal achievement
[the referee] points to the spot and blew the whistle... I'm the penalty taker and I know that it was going to be me. Okay, my job now is to score and put this away	Goals change, and emerge, in response to situational demands during the performance	
They're the main, the three main goals I'll reflect on, and then I'll reflect based on what I've done in terms of my responsibility on the field	Clutch performance may be assessed against multiple goals	
I felt I was stepping up, doing passes that I wouldn't normally do	Clutch performance means increased performance	Clutch performance exists on a performance spectrum
[clutch performance] is more a maintenance of the performance, not so much increasing it	Clutch performance means maintaining performance level	

the perception of the degree of pressure can change, or the challenge, influences that [performance assessment]	Psychological demands influence performance assessment	
I compare it to previous performances	Comparing performance against previous performances	Different benchmarks are used to assess clutch performance
It's just based on the situation I'm put in on the day. No real match is the same	Assessing clutch performance on the individual performance itself	

5.4.1 Clutch Performance is Assessed Against Goal Achievement

When reflecting on their performance, participants described using the extent to which they achieved their goals as an indicator of clutch performance: “I would say it’s meeting my goals. I feel like for me to have a clutch performance, it’s about doing the little things that I plan to do well” (Rugby Union Player 4). Specifically, participants described *assessing clutch performance based on self-referenced goals rather than outcome goals*:

Interviewer: If you guys had lost, do you think it would have changed how you viewed your performance?

Rugby Union Player 1: No, I’d still view my performance the same. I’m still looking at what I’ve done, what I’ve achieved, and what I could have improved or done better. I’m not so much focusing on anyone else, or the end result, it’s more to do with myself and what I did.

In some instances, these goals reflected a process focus (i.e., execution of behaviours, skills, and strategies; Kingston & Wilson, 2009). For example, Rugby Sevens Player 1 assessed their performance against a number of specific process goals: “just pushing up and around effort areas so if someone makes a break, make sure I’m there. And it was about timing into the ruck. Those two things, I would base my performance on. Those were my two goals”. Other participants, meanwhile, described assessing their performance against a more holistic goal of their contribution to the team: “how I would measure a good game [under pressure], yeah, it’s just about doing your job” (Soccer

Player 4). Participants also discussed setting performance goals (i.e., end products of performance against self-referenced standards; Kingston & Hardy, 2009). For example, reflecting on winning their race, Half Marathon Runner 2 described the performance product as more important than the outcome: “And even if I wouldn't have won on the weekend, I still would have had the same feelings of positivity about it... if I'd run 1:16, and come fourth, like I did two years ago, I'd still be as happy”. Indeed, it appeared that the nature of the sport in which participants were competing may have influenced whether such goals specified an objective, end-product (e.g., running a specific time), or were more subjective targets (e.g., doing their job).

Whilst participants set goals prior to the performance, participants' goals also *changed, and new goals emerged, in response to situational demands during the performance*. Such goals were often short-term and emerged in response to the changing demands of the situation, as Rugby Union Player 2 described:

They've given away the penalty. Alright, kick the line out. Then it's like, I've got to win this line out... We win the line out, and then it's like, set the maul, score the try. We score the try... win the ball from the kick-off... we've got to take our time, hold possession and try to draw the penalty... we had no room for error. We couldn't make a mistake, and that's why I think it was about ticking off one goal at a time.

Half Marathon Runner 2 also reported that a change in goal pursuit could be more conscious and deliberate, and that the recognition of when to change goals was an important aspect of performing well under pressure: “It's those little adjustments you make on the day, I guess, according to, you know, the variables – you've got to be a flexible racer, you just can't totally stick to your game plan the whole time”.

Given the emergence of different goals during the performance, participants *assessed clutch performance against multiple goals*: “if I achieved those goals, but I still felt nervous and pressure, I would still think I performed well... I’ve ticked the boxes, I can walk away and be like, I’ve done my job” (Rugby Sevens Player 2). In assessing their performance, participants described considering both goals set prior to performance (“I’ll see if I’ve achieved the little goals, I set myself, the little goals that the coaches have set me” [Rugby Union Player 1]), as well as goals which emerged during the performance (“I can’t not think that it influences my performance... it has to be considered, I missed a penalty” [Soccer Player 2]). As such, participants assessed clutch performance based on self-referenced goals, which considered multiple goals ranging in both temporality (i.e., micro goals, or goals for the entire performance) and when they were set (i.e., prior to, or during, performance).

5.4.2 Clutch Performance Exists on a Performance Spectrum

Participants’ views varied on the performance level required for clutch performance. A number of participants reported that *clutch performance meant increased performance*: “take it to a new level... trying to make a big play” (Rugby League Player 1). However, what this increase looked like differed across participants, and may have been dependent on their own goals and role in the team. For example, Rugby Sevens Player 2 discussed increasing effort: “I think it’s increasing... just doing all that 1% stuff, say there’s a loose ball, sprinting for it no matter what. Say someone boots it, even if it’s at the other end you sprint for it”. In contrast, Rugby Union Player 3 reflected: “the ability to rise to the occasion... it’s pretty important... it’s more so action, and communication... a communicative stance and just being assertive in decision making”. This view was primarily reported by participants competing in fluid, team-based sports (e.g., rugby union), and in which improved performance was

primarily reflected in process-based areas, such as increased effort or focusing on mental approaches (i.e., being assertive), rather than increased objective indicators (such as winning, or increasing statistics).

Participants also challenged the notion of requiring increased performance, and suggested *clutch performance is maintaining your performance level*:

it's more of a maintenance thing than an increase... if you're not already functioning at that level then I don't think that pressure is going to help I really don't feel like once you're in a specific competition setting that the pressure right then and there will suddenly bring out a better [performance] (Submission Grappler).

Indeed, some participants reflected that the situation influenced the performance level required: "I love when I have to like, increase my performance under pressure. But typically, it's situational, where it just depends on what needs to be done to give myself the best chance of winning" (Golfer). When assessing their performance level, participants also considered the *psychological demands of the performance*. This consideration was reflected in the notion of clutch performance existing on a spectrum, where some performances may be more clutch than others. Within this, there was a recognition that the amount of pressure experienced needs to be weighed against the performance level:

I don't think it's either, it's in or it's out, and maybe it's on a spectrum when you get there. So, I think maybe you enter a level, and then within that, there is level of performance. But then that also needs to be weighed up against the level of pressure, so it's kind of like where does that sit. So that bit more complex (Camogie Player).

Accordingly, it may be the case that the performance level for clutch performance may exist on a spectrum, rather than being binary, which is shaped by the athlete's own goals, expectations, and the situational demands of their performance.

5.4.3 Different Benchmarks Are Used to Assess Clutch Performance

Participants' views varied surrounding the performance benchmarks used to assess clutch performance. A number of participants reflected that they *compared their performance against previous performances*: "I compare it to my previous performances, and not just winning per say, but more as improving upon previous performances to that time" (Submission Grappler). Such previous performance could have been temporally recent, for example, the participant's latest performance: "I was in the grind longer than usual, [longer] than last week's game" (Rugby League Player 1). Other participants, meanwhile, reflected comparing their performance to a standard they had reached in the past:

Interviewer: When you're looking at your performance, are you comparing it to when you were competing, for say the [international] team in 2017 and 2018, or is it like more relative to where you're at now, given what you've had to go through?

Rugby Sevens Player 4: I would say, yeah, 2018. I was playing good footy in 2018. I was happy where I was at.

In contrast, participants reported *assessing clutch performance on the individual performance itself*. In this instance, no previous performance benchmark was employed as a comparison point, but rather reflected a contextually dependent approach to assessing performance. For example, Soccer Player 3 reflected: "I don't compare myself based on other games, because every game is different". Similarly, a Golfer discussed that even when performing at the same course as they had in the past, their focus was on

the current performance: “It's definitely more of a case of just like looking at the easy holes and being like, these are the ones I've got to birdie, not the ones that I've birdied in the past”. The benefit of assessing the individual performance itself, rather than comparing it to a benchmark, was encapsulated by Rugby Sevens Player 1:

In the past, I used to compare it to, I played at this level, so I know that this is what I can do. But obviously over time, the teams change, the way you play changes, the game changes... More recently, I use a lot of videos.... in terms of doing my job, where was I, what were some opportunities where I could have taken on a different opportunity... I know straight what I actually should have done, or whether it was the right option... it's hard, there's no baseline to be able to match your performance.

Of note, this discrepancy in views surrounding what benchmarks clutch performance may be compared against, if any, appeared specific to individual participants. That is, even participants competing within the same sport (e.g., rugby sevens) reported different perspectives, suggesting that individual interpretations may play an important role in assessing and identifying clutch performances.

5.5 Discussion

The aims of the current study were to explore athletes' perceptions of: (1) what performance level constitutes a clutch performance, and (2) what performance benchmarks clutch performances are compared against. The findings suggest that athletes primarily utilise self-referenced goals to assess their own performances under pressure. Such goals may be developed prior to performance but may also change and emerge during performance. Accordingly, athletes assessed their performance based on the extent to which multiple goals were achieved. Meanwhile, whilst some athletes' viewed performance maintenance as the threshold for clutch performance, others

reflected that clutch performance involved a deliberate increase in physical or mental effort. Lastly, different benchmarks were reported to compare clutch performance against. It was found that whilst some athletes compared their performance to previous performances, others assessed clutch performance based on the individual performance itself. Overall, these findings suggest that clutch performance can be assessed based on the extent to which athletes perceive achievement of self-referenced goals.

Conceptualising clutch performance in this manner may resolve tensions between existing definitions of clutch performance, specifically in regard to the performance level required.

5.5.1 How Do Athletes Assess Clutch Performances?

The primary indicator athletes utilised to assess clutch performance was the extent to which they achieved their self-referenced goals. The goals athletes pursued, and subsequently, the goals which they judged their performance on, differed in both type and temporality. Whilst athletes did report pursuing outcome goals with interpersonal comparisons (i.e., win the contest; Kingston & Wilson, 2009), clutch performances were assessed on the achievement of self-referenced goals (i.e., against personal standards; Kingston & Wilson, 2009). In some instances, these goals reflected a process focus, such as successfully executing certain behaviours or strategies (Williams, 2013). In other instances, these goals were performance focused, and specified an end product of performance (i.e., run a certain time; Kingston & Wilson, 2009). The temporality of these goals also differed across athletes and was influenced by the performance context. When goals changed, or when new goals emerged during the event, these were often short-term and with a focus on an immediate performance response (i.e., scoring a penalty). Previous research has reported that athletes who experienced clutch states (the subjective state purported to underlie clutch performance;

Swann et al., 2019) set specific goals in response to increased awareness of changing situational demands, such as realising they were in a position to achieve a personal best (Swann et al., 2017a, 2017b). Similar to the current findings, such goals emerged in response to the situation, and often were performance orientated. In sum, whilst goal type and temporality differed across athletes and fluctuated during the event, clutch performance was assessed on the extent to which athletes achieved their self-referenced goals under pressure.

The role of goal pursuit underlies initial conceptualisations of performance under pressure. Whilst goals have typically been positioned as a learned strategy or technique (e.g., Kyllö & Landers, 1995), there is also a recognition that goal pursuit, consciously or unconsciously, directs human behaviour (e.g., Locke & Latham, 2013). In conceptualising performance under pressure, Baumeister and Showers (1986) denoted that “performance situations imply a goal of immediate, maximal achievement” (p. 362). Indeed, this definition of performance aligns with the current findings, which found that athletes set short-term goals focused on the immediate performance in response to situational changes. Similarly, Baumeister (1984) highlighted that goal pursuit may underlie the appraisal of pressure, noting that “the fact that subjects could avoid the effects of pressure by abandoning the goal also implies the situation alone does not create pressure” (p. 617-618). Accordingly, the current findings build upon this initial recognition of the role of goal pursuit when performing under pressure, by suggesting that athletes utilise the extent to which they achieve their self-referenced goals to assess clutch performance.

A novel finding from the current study was that athletes may not compare a clutch performance against a previous performance. Archival research on clutch performance has relied on employing benchmarks to compare performance against,

such as: career average (e.g., Jetter & Walker, 2015); previous season performance (e.g., Birnbaum, 2008); same season performance (e.g., Otten & Barrett, 2013); or, same game performance (e.g., Wallace et al., 2013). Whilst athletes from the current study did report comparing their performance to previous performances, it was also found that athletes assessed their performance based on the performance itself. Within the larger context of these athletes utilising goals to assess their performance against, this finding reflects a more situational, and context dependent, assessment of clutch performance, and suggests that a comparative benchmark of previous performance may not be required.

5.5.2 What Performance Level is Required for Clutch Performance?

Clutch performance may involve a performance increase, but this may not be reflected in skilled performance. A number of athletes in the current study reflected that clutch performance required increased performance, although this improvement was in the context of their own goals for the event. Specifically, athletes sought to improve their performance in areas such as effort or decision making, rather than objective, or outcome-based, criteria (e.g., statistical increases). This finding reflects archival evidence by Solomonov et al. (2015), who found that NBA players with a reputation for producing clutch performances increased their performance in regards to measures of effort (i.e., field goal attempts), rather than in measures of skill (i.e., field goal percentage), during the final moments of close, important games. In this sense, Solomonov et al. (2015) suggested such clutch performances involved “doing more” rather than “doing better” (p. 133). Furthermore, previous research has also suggested that in the occurrence of clutch states, athletes make a decision to step up their intensity and effort (Swann et al., 2017b). Indeed, athletes from the current study raised questions over how one could increase their skilled performance under pressure, and reflected for

that for them, clutch performances only required maintaining your performance level. In summary, whilst the findings did support the notion of clutch performance as requiring increased performance (e.g., Otten, 2009), this was reflected in the context of increased physical or mental effort, with athletes questioning the notion of increasing skilled performance.

5.5.3 Considerations for Defining Clutch Performance

The current findings suggest that goal achievement may offer an avenue to define the performance requirement for clutch performance. To date, the debate surrounding what performance level is required for clutch performance has centred on contrasting increased performance against maintained performance (Schweickle et al., 2020; Study 1). Inherently, these approaches have focused on comparing clutch performance to a specific benchmark (e.g., Solomonov et al., 2015). Findings from the current study, however, suggest that athletes may assess clutch performance based on goal achievement, reflecting a more context-dependent, situational, and subjective view of clutch performance. From a critical realist perspective (e.g., Danermark et al., 2002), this view reflects the notion that clutch performance *is* about goal achievement (i.e., at an ontological level), but how such goal achievement is assessed may be contingent upon the situation and context in which such goals were pursued, and further, how such goals occurred (i.e., the epistemological level). Indeed, whilst such goal achievement could be compared against a previous performance benchmark, it may also be assessed on the performance itself. Assessing clutch performance based on goal achievement may appear a departure from current approaches to defining clutch performance (Hibbs, 2010; Otten, 2009), however, this approach aligns with original conceptualisations of performance under pressure (Baumeister, 1984; Baumeister & Showers, 1986), which highlight the inherent nature of goal pursuit whilst performing under pressure.

Schweickle et al. (2021; Study 2) suggested that clutch performances occur during “an appraisal of increased pressure” (p. 8). As such, and in line with the current findings, a potential definitional refinement may be to conceptualise clutch performance as *the extent to which self-referenced goals are achieved during an appraisal of increased pressure*.

The conceptual implications of offering a potential definition of clutch performance based on goal achievement are important to consider. Schweickle et al. (2021; Study 2) suggested that the perception of clutch situations (i.e., appraisal of increased pressure) could occur at different temporal levels. Specifically, Schweickle et al. (2021; Study 2) suggested that there may clutch moments (i.e., a micro-level perspective focusing on a specific competitive moment, for example, a penalty kick), and clutch performances (i.e., a meso-level perspective which considers performance for the entire event). Defining clutch performance based on goal achievement lends itself to both of these temporal perspectives. That is, a clutch moment may be achieving a self-referenced goal during a specific competitive moment (e.g., “hit this penalty on target”), whilst a clutch performance may relate to the extent to which the athlete achieved their goal for the entire event (e.g., “shoot four under for the round”). Indeed, such a perspective also has implications for how the concept of clutch states (i.e., the psychological state purported to underlie clutch performances; Swann et al., 2019) may be defined. Specifically, both clutch states and clutch moments are temporally brief, occur during a specific appraisal of pressure, and involve pursuing a primary goal which often emerges in response to situational changes (Swann et al., 2017a, 2017b, 2019). Accordingly, clutch states may be more relevant to clutch moments, as opposed to the temporally extended perspective of clutch performances (i.e., performance assessment and pressure appraisal across the entire event). As such, descriptions of clutch states

may need to be refined to specify the relevance of these states to clutch moments, rather than clutch performances.

From a measurement perspective, utilising goal achievement to assess clutch performance may prompt scepticism from a field which has largely employed archival designs (Schweickle et al., 2020; Study 1). That is, there would be no way to observe, from an archival perspective, if athletes have achieved their goals or not. However, given clutch performance is a psychological phenomenon (Otten, 2013), which inherently relies upon the appraisal of pressure (Hibbs, 2010; Otten, 2009; Schweickle et al., 2021; Study 2), questions have previously been raised over the extent to which archival designs validly measure clutch performance, given such designs rely on indirect, proxy measures of psychological pressure (Schweickle et al., 2020; Study 1). Accordingly, any measure of clutch performance would already require an assessment of the performance from the athlete's perspective to examine if they appraised pressure. As such, positioning clutch performance as a goal-dependent phenomenon aligns with recent conceptual and measurement directions within the field of clutch performance.

5.5.4 Strengths, Limitations and Future Directions

Strengths of this study include the use of event-focused interviews, high information power, and the number of steps taken to increase validity. However, there were also a number of limitations to the current study. First, the expertise of the sample ranged from recreational to competitive-elite athletes (Swann et al., 2015). It may be the case, however, that athletes competing at a higher level of expertise have different performance demands (e.g., having to attain certain performance outcomes to retain funding; McKay et al., 2008). Accordingly, athletes at higher levels of competition may have different perspectives on what is considered clutch performance. Second, the majority of athletes from the current sample were drawn from team sports. It may be the

case that perceptions of performance under pressure in team sport, in which individual performance sits within the context of the broader team performance, may differ. For example, team cohesion and motivational climate have been suggested as factors which may impact performance under pressure (Hill & Shaw, 2013), whilst athletes may feel free to take more risks in their performance in teams perceived to have high psychological safety (Fransen et al., 2020). Lastly, the participants were primarily Australian athletes, competing between a recreational and competitive-elite level, and the findings should be considered within this cultural context. For example, athletes from a North American context, in which the term clutch performance originated (e.g., Safire, 2005) and has long been used within sporting culture (e.g., West & Libby, 1969), may hold different perceptions surrounding what clutch performance entails. Despite this, we believe these findings allow for conceptual generalisability (Smith, 2018). That is, by examining athletes' perceptions of the requirements for clutch performance, these findings offer a new lens through which to view the concept, which can then be generalised (Atkinson, 2017).

Future research should continue to build upon these findings by focusing efforts on refining definitions, developing measures, and understanding the occurrence of clutch performance. To continue to refine definitions of clutch performance, the type of goals utilised to classify a clutch performance should be considered. For example, athletes reported utilising both process and performance goals to assess clutch performance. However, questions may be raised over to extent to which the achievement of process goals represents the concept of clutch performance, and whether this dilutes the concept. Partly, this issue stems from a lack of theory underlying the tripartite distinction of goals (i.e., process, performance, and outcome goals; Kingston & Wilson, 2009), which has resulted in a lack of clarity surrounding the boundaries

between goal types, the temporal nature of different types of goals, and the impact of different types of process goals (i.e., behaviour, skills, strategies). As such, future research may also work towards developing a more robust foundation for the widely used tripartite distinction of goal types in sport. Furthermore, this definition should be tested with athletes from a broader range of sports and expertise levels, in addition to other key stakeholders such as coaches. Efforts should also be made to develop a measure of clutch performance. Specifically, this may involve considering how to measure concepts central to clutch performance, as well as delineating between clutch moments and clutch performance. Naturally, development of a measure will facilitate efforts to expand clutch performance research by incorporating cross-sectional, longitudinal, and experimental designs. These steps should underlie an eventual aim of an increased understanding of how clutch performances occur, which will allow for development and testing of interventions to facilitate clutch performance in athletes.

5.5.5 Conclusion

This study aimed to explore the definitional boundaries of clutch performance. Specifically, this study examined athletes' perceptions of what performance level constitutes a clutch performance, and further, what such performances are compared against. Whilst perceptions varied, the findings indicated that broadly, clutch performance was considered a situational and context-dependent phenomenon. Accordingly, athletes utilised self-referenced goals to assess their performances under pressure, which did not necessitate a comparison against a previous performance benchmark. It was therefore suggested that the level required for clutch performance may not be a decision between increased, or maintained, performance, but could rather be the extent to which athletes achieve their self-referenced goals under an increased appraisal of pressure. Practitioners may benefit by recognising that clutch performances

involve the pursuit of multiple and changing goals, which performance can then be assessed against. Future research is needed to continue works to refine the definition of clutch performance, as well as the development of a measure of clutch performance.

Chapter 6: General Discussion and Conclusions

6.1 Foreword

The following Chapter provides a refined definition and conceptualisation of clutch performance based on the program of research presented above and discusses the theoretical and applied implications which stem from the findings reported in this thesis. A key finding reported in Chapter 3 (Study 2; Schweickle et al., 2021), and discussed in both Chapters 4 and 5 (Studies 3 and 4), is that clutch moments are bound by different temporal limits than clutch performance. In light of this finding, it is important to specify that in this Chapter, the terminology *clutch performance* was used to refer to both of these temporal perspectives, unless otherwise specified.

6.2 Summary

The overarching aim of this thesis was to examine the conceptual foundations of clutch performance by drawing on athletes' experiences of performing well under pressure. In doing so, I sought to provide a refined definition and conceptualisation of the construct of clutch performance. To achieve this aim, four studies were conducted. Chapter 2 (Study 1; Schweickle et al., 2020) comprised of a systematic review, in which a narrative synthesis of all the available empirical literature on clutch performance in sport and exercise was conducted. Chapter 3 (Study 2; Schweickle et al., 2021) consisted of a qualitative study aimed at exploring the "clutch" in clutch performance, which involved examining athletes' perceptions of clutch situations, and how these perceptions influenced their performance. Chapter 4 (Study 3) comprised of a mixed methods multiple case study (e.g., Yin et al., 2014) aimed at examining the type of performance indicators athletes use to identify their own clutch performances. Specifically, Chapter 4 sought to gain a better understanding of whether clutch performances should be assessed using objective indicators (e.g., performance statistics)

or subjective indicators (e.g., perceived performance). Lastly, Chapter 5 (Study 4) consisted of a qualitative study aimed at exploring athletes' perceptions of the performance level required for clutch performance (i.e., does performance need to increase, or be maintained), and further, what benchmarks athletes' compare such performances against.

A summary of the results from each of the above studies is discussed below in the context of the thesis sub-aims provided in Chapter 1, which were to: (1) systematically collate, synthesise, and review existing empirical research on clutch performance in sport and exercise, and identify the key areas requiring investigation; (2) explore when, and under what conditions, clutch performances may occur; (3) understand if clutch performance should be assessed as an objective, or subjective, performance phenomenon; (4) examine the performance level required for clutch performance; and, (5) provide a refined understanding over what clutch performance is, and how it should be defined. This summary is preceded by an outline of a refined definition and conceptualisation of clutch performance, and a discussion of the theoretical and applied implications, as well as the limitations, of this program of research.

6.2.1 Synthesis of Clutch Performance Literature

The first aim of this thesis was to provide an in-depth overview of the field of clutch performance, by systematically reviewing, synthesising, and evaluating all available empirical literature on clutch performance in sport and exercise. This aim was addressed in Chapter 2 (Study 1; Schweickle et al., 2020), in which a narrative synthesis of 27 studies was conducted. The findings from this Study indicated that there was considerable definitional, conceptual, and measurement heterogeneity within the field of clutch performance. Specifically, there were multiple, conflicting definitions of clutch

within the literature, which included defining clutch in terms of a performance (e.g., Otten, 2009), an ability (e.g., Jetter & Walker, 2015), a situation (e.g., Birnbaum 2008), and a psychological state (e.g., Swann et al., 2019). Consequently, two distinct approaches were adopted within the literature to examining clutch performance: (1) as an ability; and (2) as an isolated episode of performance. Multiple theoretical frameworks, meanwhile, were used to explain clutch performance, which largely centred on anxiety-related theories (e.g., distraction theories, self-focus theories) or the Integrated Model of Flow and Clutch States (e.g., Swann et al., 2017b). Lastly, it was reported that measurement of pressure within clutch performance research largely relied on proxy measures. That is, the experience of pressure was inferred by the presence of situational variables within archival designs (e.g., playoffs; Otten & Barrett, 2013), whilst psychometric measures of anxiety were used to measure pressure in experimental designs (e.g., Gray et al., 2013). From the evaluation of the literature, it was determined in Chapter 2 that greater definitional clarity was fundamental to resolving the conceptual and measurement heterogeneity within the field of clutch performance.

Chapter 2 reported four key recommendations for progressing the field of clutch performance, specifically that: (1) the focus of research should be upon investigating episodes of clutch performance, rather than clutch ability; (2) direct measurement of pressure is required, and is critical to understanding when clutch performances may occur and how pressure may influence performance; (3) researchers should consider whether clutch performance should be assessed using objective, or subjective, performance indicators; and, (4) gaining clarity on the performance level required for clutch performance is critical in defining, conceptualising, and measuring this phenomenon. These recommendations provided the foundation for the research questions explored in Chapters 3, 4, and 5.

6.2.2 When Do Clutch Performances Occur?

The second aim of this thesis was to explore when, and under what conditions, clutch performances may occur. This aim was explored in Chapter 3 (Study 2; Schweickle et al., 2021), with a specific focus on gaining clarity over what the “clutch” in clutch performance means to athletes, which had previously been treated either as a situational variable (e.g., Cao et al., 2011) or a subjective appraisal of pressure (e.g., Swann et al., 2017a). A qualitative methodology was adopted in which 16 athletes partook in event-focused interviews (Jackman et al., 2021) following performing well in a high-pressure event ($M = 96$ hours after the event). Whilst these events involved situational sources of pressure (e.g., knockout competitions, finals; Baumeister & Showers, 1986), it was a requirement that participants reported experiencing pressure to be involved in the study.

It was reported in Chapter 3 (Study 2; Schweickle et al., 2021) that the appraisal of the clutch was influenced by both situational (e.g., importance of event, changes during the event, breaks in play), and subjective, (e.g., perceived expectations, previous performance) factors. This appraisal of the clutch, however, fluctuated throughout the event, and occurred across multiple, distinct episodes. Given the episodic nature of these appraisals, it was proposed that there may be multiple *clutch moments* (i.e., pressure appraisal during a specific competitive moment) within an event, and that *clutch performance* may refer to the overall appraisal of pressure across the entire event. It was also reported in Chapter 3 that pressure had a dynamic influence on performance. That is, several athletes reflected that pressure was facilitative to their performance. Other athletes, meanwhile, discussed that they had to actively manage the influence of pressure to perform optimally. Indeed, whilst pressure resulted in the experience of anxiety for some athletes, other athletes did not report experiencing anxiety, raising

questions over whether anxiety-based theoretical explanations (e.g., attentional theories; Mesagno & Beckmann, 2017) can account for all instances of clutch performance. In sum, it was concluded within Chapter 3 that clutch moments occur during an episode of increased appraisal of pressure within an event (of which there may be multiple), whilst clutch performances occur during an increased appraisal of pressure across the entire event.

6.2.3 Is Clutch Performance an Objective, or Subjective, Performance

Phenomenon?

Previous research has examined clutch performance as both an objective (i.e., performance statistics; Otten & Barret, 2013), and subjective (i.e., perceived performance; Swann et al., 2017a), performance phenomenon. This heterogeneity stems from a lack of clarity within definitions (Hibbs, 2010; Otten, 2009) regarding whether clutch performance can, or should, be assessed using objective, or subjective, performance criteria. Accordingly, the third aim of this thesis was to examine whether athletes identify clutch performance by using objective (i.e., performance statistics), or subjective (i.e., perceived performance), indicators of performance, or a combination of both. This aim was explored in Chapter 4 (Study 3), in which a mixed methods multiple case study design was adopted (e.g., Yin, 2014). Four semi-elite basketballers' performances were observed during high-pressure matches (e.g., must-win matches, playoffs; Baumeister & Showers, 1986), and their performance statistics examined. Further, these basketballers completed a screening questionnaire and partook in an event-focused interview (Jackman et al., 2021; $M = 95.75$ hours after the event).

It was reported in Chapter 4 that whilst objective indicators were important for identifying clutch performance, these indicators were viewed by participants through a subjective lens. That is, factors such as pressure appraisal influenced how these

basketballers interpreted their objective performance indicators. Meanwhile, subjective indicators such as perceived effort, decision making, and perceived control were also important in identifying clutch performance. This finding contrasted with the approach adopted in the majority of clutch performance research, which has primarily used objective performance indicators to assess clutch performance (e.g., Jetter & Walker, 2015). Furthermore, it was reported that winning was not required for identifying a clutch performance, but rather, clutch performances involved a sense of contributing to the team's overall performance. This finding contrasted Hibbs' (2010) delineation that to be classified as a clutch performance, the performance must have a significant impact on the outcome of the contest. Accordingly, it was concluded in Chapter 4 that typical approaches to assessing clutch performance (i.e., using only objective performance statistics) may not be sufficient for capturing all instances of clutch performance. Subjective reflections of performance, therefore, appear critical to identifying and assessing clutch performances.

6.2.4 What Performance Level is Required for Clutch Performance?

Prominent definitions of clutch performance contrast over whether clutch performance involves increased performance (e.g., Otten, 2009), or whether maintained performance is sufficient (e.g., Hibbs, 2010). Further, it was reported in Chapter 2 (Study 1) that a range of performance benchmarks (e.g., within-game performance, season average, career average; Schweickle et al., 2020) have been used to compare clutch performance when evaluating whether performance has increased, or been maintained. Accordingly, the fourth aim of the current thesis was to examine the performance level required for clutch performance. This aim was addressed in Chapter 5 (Study 4), which focused on exploring athletes' perceptions of the performance level required for clutch performance, and further, what these performances were compared

against. A qualitative methodology was adopted, in which 24 athletes participated in event-focused interviews (Jackman et al., 2021; $M = 93.08$ hours after the event) following either positive objective, or subjective, performance in a high-pressured event.

It was reported in Chapter 5 that clutch performance is a contextually dependent phenomenon. That is, athletes primarily reported utilising the extent to which they achieved their own self-referenced goals to assess their clutch performances. As such, views surrounding the notion of whether clutch performance required increased or maintained performance varied and depended on the athletes own goals and appraisals of pressure. When athletes did discuss improving their performance under pressure, this was typically in the context of process-based areas such as effort or decision making (e.g., Munroe-Chandler et al., 2004). Similarly, whilst some athletes used previous performances as a benchmark to compare clutch performances against, others discussed assessing clutch performance on the individual performance itself, in which no comparative benchmark was employed. Accordingly, self-referenced, performance-related goals appeared critical to both how athletes assessed clutch performance, and their views surrounding the performance level they were trying to achieve.

6.2.5 What is Clutch Performance?

The last aim of this thesis was to provide a refined understanding of what the concept of clutch performance is, and how it should be defined. The findings from Chapters 3, 4, and 5 indicated that clutch performance is a subjective and contextually dependent phenomenon. Specifically, appraisals of pressure may be influenced by a range of different sources, and these appraisals may differ between individuals and fluctuate throughout an event. Meanwhile, identifying clutch performance is dependent on the goals an athlete pursues during an event, which may be set prior to, or emerge

during, the event. In assessing this goal achievement, athletes may draw on both objective, and subjective, indicators of performance.

Accordingly, I propose that clutch performance may be defined as *the extent to which a performer achieves their performance-related goals during an overall appraisal of increased pressure across an event*. As discussed in Chapter 3 (Study 2; Schweickle et al., 2021), there may also be clutch moments within an event, which are accordingly defined as *the achievement of the primary performance-related goal during an appraisal of increased pressure*. A detailed explanation of these definitions, including the principles underlying these, is provided below, and preceded by a discussion of the theoretical and applied implications of this proposed understanding.

6.3 A Refined Definition and Conceptualisation of Clutch Performance

A core aim of this thesis was to provide a refined understanding of clutch performance by drawing on athletes own experiences and assessments of performing under pressure. This section outlines the principles underlying the refined definition of clutch performance, delineates the differences between clutch moments and clutch performances, and discusses the conceptual implications stemming from this refined definition. The proposed definition and underlying principles represent an attempt at *sharpening* (i.e., making more precise; Bunge, 2009) the concept of clutch performance, based on the collective body of research presented within this thesis. In proposing both the refined definition and its underlying principles, a Popperian approach is adopted (Popper, 1981). That is, this definition is provided with the intent of stimulating further debate and research within the field of clutch performance research, rather than eliminating scientific disagreement or dissent (Bunge, 2009; Popper, 1981). Whilst the principles provided below broadly underlie the definitions of both clutch performance

and clutch moments, a discussion of the differences between these two constructs is provided at the end of each principle.

6.3.1 Underlying Principles of Clutch Performance

6.3.1.1 Principle 1a: Clutch Performance Requires the Appraisal of Pressure

The appraisal of pressure is a necessary condition of clutch performance. Pressure is defined as the presence of incentives for optimal, maximal, or superior performance, in which there is an increased importance of performing well (Baumeister, 1984; Baumeister & Showers, 1986). A subjective component exists in the appraisal of pressure, in which the performer must be both aware of the incentives for optimal performance, and motivated to perform well in response to these incentives (Baumeister, 1984; Baumeister & Showers, 1986). Findings from Chapter 3 (Study 2; Schweickle et al., 2021) demonstrated that both situational factors (e.g., type of event, changes within the event, breaks in play) and internal factors (e.g., expectations, perceptions of previous performance) interacted to influence an athlete's appraisal of pressure. As such, pressure is a subjective appraisal that may be influenced by both situational and internal factors, with the appraisal of pressure a necessary condition for clutch performance.

Findings from this thesis suggest pressure is a continuous variable and may fluctuate throughout an event. Chapters 3 (Study 2) and 4 (Study 3) both provided reports of athletes' experiencing different intensities of pressure throughout an event. As depicted in the within-case analyses presented in Chapter 4, this appraisal may have multiple peaks, and troughs, throughout an event. Indeed, it appears that fluctuations in situational (e.g., the score), and internal (e.g., perceived performance), factors impact the intensity of pressure an athlete may appraise throughout an event. These findings align with Baumeister and Showers (1986) conceptualisation of pressure, who noted

that pressure is inherently episodic and may be experienced in multiple, distinct moments throughout an event. Both the appraisal of pressure, and the intensity at which pressure is experienced, therefore, may fluctuate throughout an event.

6.3.1.2 Principle 1b: The Intensity of Pressure Appraisal Must be Increased

Compared to Typical Competitive Circumstances

It is well established that pressure is a common, if not inherent, component of competitive sport (Low et al., 2020). Situational factors proposed to increase pressure, such as the presence of competitors or spectators and the contingency of rewards, are present in most competitive encounters (Baumeister & Showers, 1986). Meanwhile, any athlete motivated to perform well appears likely to experience pressure (Baumeister, 1984). For example, it was demonstrated in Chapter 4 (Study 3) that athletes experienced pressure in normal competitive matches. Specifically, in responding to the screening questionnaire on the intensity of pressure experienced during typical competitive circumstances, all participants reported typically experiencing a moderate amount of pressure ($M = 5/10$, $SD = .81$). The relevance of highlighting the presence of pressure in typical competitive encounters is that if clutch performance is defined by performance under *any amount* of pressure, there appears a risk of the construct being so broadly defined that it loses meaningfulness (i.e., construct stretching; Spiker & Hammer, 2019; Wacker, 2004). That is, clutch performances (and clutch moments) could effectively occur during any, and across all, competitive encounters, as there is typically some level of pressure present. As shown in Chapter 2 (Study 1; Schweickle et al., 2020), however, such a delineation would not appear to reflect how researchers have positioned clutch performance, with investigations usually centred on circumstances perceived to involve increased pressure (e.g., playoffs; Otten & Barrett, 2013). To delineate the concept of clutch performance from simply any positive performance

under any amount of pressure, therefore, it is necessary that clutch performances occur during an appraisal of increased pressure compared to typical competitive circumstances. The notion of what constitutes such typical competitive circumstances will differ, and be relative, to the individual athlete.

The temporal boundaries of appraising increased pressure differ between clutch moments and clutch performances. Specifically, clutch moments refer to a specific episode of increased pressure appraisal. Clutch moments, therefore, reflect a micro-level perspective (e.g., a ‘snapshot’ of a performer’s pressure appraisal at one moment; Thomas et al., 2009). As these appraisals of increased pressure fluctuate throughout an event, both in awareness and intensity, there may be multiple clutch moments within an event. For example, a clutch moment may be a rugby player attempting a sideline conversion, or similarly, an American football (i.e., gridiron) placekicker attempting a field goal. Clutch performances, meanwhile, represent a meso-level perspective of pressure (e.g., a finite time period; Thomas et al., 2009). That is, clutch performances refer to an overall appraisal of increased pressure across the entire event. This does not mean a performer must appraise increased pressure for every moment of the event, but rather that as an overall reflection, the performer experienced more pressure than normal. Consequently, a clutch performance may contain multiple clutch moments. The boundaries between clutch moments and clutch performances, however, may be less clear in sports of very short durations (e.g., 100m sprint), and therefore may be considered more analogous in such contexts. In sum, both clutch moments and clutch performances require an appraisal of increased pressure, although the temporal boundaries of this appraisal differ.

6.3.1.3 Principle 2a: Clutch Performance is Assessed on Goal Achievement

Goals, both consciously and unconsciously, direct and motivate human behaviour (Locke & Latham, 2013). It was reported in Chapter 5 (Study 4) that during clutch performances, athletes pursued multiple goals, which may have been set in advance of the event, but which also emerged during the event in response to situational changes. Athletes reported assessing their performance against the extent to which these goals were achieved under pressure. This centrality of goal pursuit aligns with Baumeister and Showers (1986) conceptualisation of performance under pressure, who noted that “performance situations imply a goal of immediate, maximal achievement” (p. 362). Similarly, Baumeister (1984) noted that “the fact that subjects could avoid the effects of pressure by abandoning the goal also implies the situation alone does not create pressure” (p. 617-618). To summarise, goals are critical in directing athletes’ performance under pressure, and athletes report assessing their performance against the extent to which they have achieved these goals.

The development of this principle stems from the findings presented in Chapters 4 (Study 3) and 5 (Study 4), which suggested that assessing clutch performance is largely subjective, and goal-dependent. Specifically, it was reported in Chapter 4 that athletes drew upon subjective indicators of performance (e.g., effort, perceived control, decision making) to identify clutch performance, and further, often viewed objective performance indicators through a subjective lens. Indeed, the types of indicators athletes drew on to assess clutch performance, and the importance placed behind these, often depended on their own goals for the performance. Similarly, it was reported in Chapter 5 that athletes views surrounding the performance level required for clutch performance often depended on their own goals, and the context of the performance. When athletes did report pursuing increased performance, such performance was often assessed on

subjective indicators such as physical or mental effort. In line with this contextual approach, athletes reported using different benchmarks to compare clutch performances against. Whilst some athletes compared their performance against previous performances, numerous athletes described assessing the performance solely on the performance itself. Utilising goal achievement as the criteria to assess clutch performance, therefore, allows the incorporation of these varied, context-dependent, and subjective approaches used by athletes in identifying their own clutch performances.

6.3.1.4 Principle 2b: Clutch Performance is the Extent to Which Self-Referenced, Performance-Related Goals are Achieved

Self-referenced, performance-related goals are used to assess clutch performance. It was reported in Chapter 5 (Study 4) that whilst athletes pursue multiple goals throughout an event, which may range in both type and temporality, clutch performances were assessed against performance-related goals (see section 6.4.3. *Tripartite Distinction of Goal Types* for discussion of the use of the terminology *performance-related* goals, rather than *performance* goals). Such goals broadly focus on a product of performance, although success is viewed against the attainment of absolute or self-referenced performance standards (Kingston & Wilson, 2009). This goal type contrasts with process goals, which focus on executing certain behaviours or strategies, and also outcome goals, which centre on the outcome of an event, and are usually assessed based on social comparisons (e.g., winning; Kingston & Wilson, 2009). There is an important distinction, however, between goal pursuit, and the assessment of goal achievement. That is, this principle is not advocating a goal setting strategy, and recognises that at different stages throughout an event, athletes may – consciously or unconsciously - pursue process, performance, or outcome goals, and often simultaneously (Gozli & Dolcini, 2018; Kingston & Wilson, 2009; Williams, 2013).

Further, these different goal types may be set in advance of an event, or emerge in response to changes during the event (e.g., Csikszentmihalyi, 2015). This principle, rather, reflects findings that athletes assess their clutch performances based on achievement of performance-related goals, which are largely within their own control, and judged against self-referenced standards.

The temporal nature of assessing performance-related goals differs between a clutch moment and a clutch performance. Clutch moments refer to the achievement of the primary performance-related goal an athlete pursued during an episode of increased pressure appraisal. Typically, such goals emerge during a competition and are short-term in nature (e.g., taking a free throw in basketball). Specifying that the assessment of a clutch moment is judged against the achievement of an athlete's *primary* goal is because athletes may hold multiple goals simultaneously, yet these goals may also exist within a hierarchy (e.g., Gozli & Dolcini, 2018). For example, a powerlifter's immediate performance-related goal may be to successfully achieve their third deadlift attempt, in the pursuit of the broader goal of achieving an overall personal best total across all three lifts (i.e., squat, bench, deadlift). Clutch performances, meanwhile, refer to the extent an athlete's performance-related goals are achieved in relation to the entire event. It was reported in Chapter 5 that whilst this goal assessment may involve considering the performance in relation to pre-specified end-goals (e.g., running a certain time in a half-marathon), it may also involve an athlete assessing their performance based on the situational goals which may have emerged during the performance (e.g., scoring a penalty). As such, assessments of clutch performance may consider the extent to which multiple performance-related goals were achieved, which may involve both pre-specified goals, and emergent goals.

6.3.1.4.1 Application of Principle 2b. The following applied example provides further insight into the use of performance-related goals to assess clutch performance. Michael Jordan's famous "The Last Shot" is perhaps one of the most widely recognised examples of a clutch moment (Woodyard, 2018). To provide context, Jordan's Chicago Bulls trailed by 1-point against the Utah Jazz in Game 6 of the 1998 NBA Finals. If the Bulls won, they would win the NBA championship, achieve a second three-peat, and Jordan would win his sixth NBA championship. With 20-seconds remaining, Jordan stole the ball in defence, dribbled up the court, and hit a 17-foot, 2-point field goal with 5 seconds remaining to win the game. Whilst it may be difficult to know Jordan's exact internal experience at this time, for the purpose of this example, the assumption is that the opportunity to win a sixth NBA championship resulted in an appraisal of increased pressure relative to typical circumstances, and as such, met the conditions for a clutch moment to occur.

Before taking "The Last Shot", it is possible Jordan was pursuing several goals. Jordan may have been aiming to win the game (i.e., outcome goal), score the basket (i.e., performance-related goal), or aiming to create space from the defender to take the shot (i.e., process goal). The central question is why, then, should performance-related goals be utilised to assess clutch performance, if it is possible Jordan may have also been pursuing process or outcome goals?

If performance in this clutch moment was assessed only on the achievement of Jordan's process goal (i.e., the execution of his skill or strategy; Kingston & Wilson, 2009), it would not matter if Jordan scored the basket or not. Indeed, the assessment of this clutch moment would only require considering if Jordan executed his process under pressure, with no consideration of the performance product of this process. Such a classification of a clutch moment, or clutch performance, however, would be a

significant departure from how such performances are discussed within research or media (i.e., Chapter 1 and 2), as well as athletes' own perspectives of assessing performance under pressure (i.e., Chapter 4 and 5). Further, the concept of clutch performance (and moments) would be at risk of being *stretched* past the point of meaningfulness (e.g., Spiker & Hammer, 2019). Alternatively, if this clutch moment was assessed only on the outcome of the contest (i.e., winning), this would largely remove the athlete's control over achieving a clutch moment or clutch performance. For example, following Jordan's successful basket, John Stockton missed a 3-point attempt to win the game for the Utah Jazz with one second remaining. If Stockton had scored, however, would this negate Jordan's clutch moment? Jordan had still handled the pressure of the situation to perform successfully in this moment, regardless of whether Stockton scored or not. From an applied perspective, meanwhile, it seems problematic to attempt to facilitate a construct (i.e., clutch performance) that is dependent on factors outside of an athletes' control. Not only, therefore, do performance-related goals align with the perspectives of athletes in Chapter 5 (Study 4), but from a conceptual standpoint, they are the most appropriate goal type for classifying both clutch moments and clutch performance.

6.3.2 Conceptual Implications for Understanding Clutch Performance

The proposed definition of clutch performance, and the principles underlying this definition, carries broader conceptual implications for how clutch performance is understood. First, clutch performance appears a continuous variable. That is, one performance may be more of a clutch performance than another, based on the extent to which one's goals are achieved, and the amount of pressure appraised above typical circumstances. Naturally, this has implications for the development of a measure of clutch performance (see 6.4.2. *Measurement Implications*). Second, multiple

competitors within the same event may have a clutch performance. As clutch performances are not contingent on an outcome being achieved (i.e., winning; Hibbs, 2010), multiple competitors may have a clutch performance if they achieve their performance-related goals under increased pressure. Such a delineation sits in contrast to how clutch performance is often discussed in the media, which typically focuses only on those who have won.

Third, clutch performance is not the opposite of choking. Whilst these constructs are positioned along a broad performance spectrum (i.e., clutch performance is a broadly positive performance response, whilst choking is a negative performance response), the mechanisms underlying these constructs, and the circumstances in which they occur, differ. Specifically, choking occurs as a result of increased anxiety, which is interpreted as debilitating and in which the athlete experiences a lack of perceived control (Mesagno & Hill, 2013a). As demonstrated in Chapter 3 (Study 2; Schweickle et al., 2021), however, clutch performances are not contingent on this initial experience of anxiety, but rather occur under an appraisal of increased pressure, in which there may be diverse emotional responses. Whilst these constructs, therefore, are positioned along a shared performance spectrum, there are different conditions necessary for the occurrence of these constructs. Accordingly, to say an athlete did not have a clutch performance does not mean an athlete choked under pressure, and conversely, to say an athlete did not choke under pressure does not mean they had a clutch performance. In summary, clutch performance is a continuous variable, which multiple competitors may experience in the same event, and is distinct from the occurrence of choking.

6.4 Theoretical Implications

6.4.1 Theoretical Explanations of Clutch Performance

Findings from the current thesis have implications for the extent to which current theoretical explanations can account for clutch performance, and further, provides an indication of which factors may be relevant to the development of a theory of clutch performance. The following sections discuss these implications.

6.4.1.1 Current Theoretical Models for Clutch Performance

As reported in Chapter 2 (Study 1; Schweickle et al., 2020), the most common explanations of clutch performance stem from models and theories which focus on the relationship between anxiety and performance. For example, self-focus theories (e.g., Gray & Cañal-Bruland, 2015), distraction theories (e.g., Owens et al., 2016), and the self-presentation model (e.g., Hill et al., 2017) have all been used as a theoretical foundation in studies examining clutch performance. Indeed, such studies have typically positioned clutch performance as the opposite of choking under pressure (e.g., Hill & Hemmings, 2015). As discussed above, however, the processes underlying clutch performance and choking under pressure appear distinct. As reported in Chapter 3 (Study 2; Schweickle et al., 2021), different emotional responses may underlie the occurrence of clutch performance. Specifically, whilst such responses may include anxiety, clutch performances and clutch moments do not appear contingent upon the experience of anxiety. Theories that centre on explaining behavioural and psychological changes in response to the experience of anxiety, therefore, do not appear to account for all instances of clutch performance.

The Integrated Model of Flow and Clutch States (Swann et al 2017b, 2019) provides a tentative model for the occurrence, experience, and outcome of clutch states (i.e., the psychological state purported to underlie clutch performance; Swann et al.,

2019). It was identified in Chapter 2 (Study 1; Schweickle et al., 2020) that a limitation of the Integrated Model in providing a theoretical explanation for clutch performance was the ambiguous relationship between clutch states and clutch performances. Specifically, it was unclear if clutch states were a necessary condition of clutch performance (i.e., could one have a clutch performance without experiencing a clutch state?). Following the proposition of an updated conceptualisation of clutch performance, however, this question can be reconsidered. Indeed, by delineating different temporal boundaries of clutch moments and clutch performance, it appears that clutch states are more relevant to clutch moments than clutch performances. That is, both clutch states and clutch moments appear short in duration, occur during a specific appraisal of pressure, involve identification of a primary goal that motivates the athlete, and often emerge in response to situational changes (Swann et al., 2017a, 2017b, 2019). In contrast, clutch states appear less relevant to clutch performances, which are characterised by a meso-level perspective of performance assessment and pressure appraisal across the entire event. Given these findings, common descriptions and definitions of clutch states may need to be refined to specify the relevance of these states to clutch moments, rather than clutch performance (Jackman et al., 2020; Swann et al., 2019). This updated perspective of clutch states is provided below in Table 6.1, which outlines the different definitions of these overlapping constructs. Future research, therefore, may focus on understanding if clutch states are necessary for clutch moments, as findings from the current thesis suggest these constructs appear to occur during similar circumstances.

Table 6.1*Refined Definitions of Clutch Performance, Clutch Moments, and Clutch States*

Construct	Refined Definition
Clutch Performance	The extent to which a performer achieves their performance-related goals during an overall appraisal of increased pressure across an event
Clutch Moment	Achievement of the primary performance-related goal during an appraisal of increased pressure.
Clutch State	The psychological state purported to underlie clutch moments

6.4.1.2 Recommendations for Developing a Theory of Clutch Performance

Given the limitations of current theoretical explanations, there is a need to develop a specific theory of clutch performance. Whilst the aims of this thesis were not directed at building a theory of clutch performance, several recommendations can be provided for the development of such a theory. First, theoretical explanations should consider that differences may exist between clutch moments and clutch performances, both in how these constructs may occur, and their outcomes for athletes. Second, the context in which clutch performances occur appears to play a fundamental role in how such performances occur. Findings from the current thesis highlighted that contextual factors such as the score, the opposition, breaks in play, and the minutes' athletes played in a match all influenced how pressure was appraised and performance assessed. Indeed, in line with a critical realist perspective, Maxwell (2012) noted that "mechanisms are not seen as general laws, or as having invariant outcomes, but as situationally contingent; their actual context is inextricably part of the causal process" (p. 36). As such, the role of context should be considered in developing a theory of clutch performance. Last, goals are central to both directing athletes' behaviour under pressure, and further, how athletes assess clutch performances. Specifically, the role of emergent goals (e.g., Csikszentmihalyi, 2015), which may be influenced by the

situation, pressure appraisal, and prior goal achievement, should be considered in a theory of clutch performance. Indeed, such theoretical development may require further clarification regarding how emergent goals fit within the tripartite distinction of goal types (see section 6.4.3. *Tripartite Distinction of Goal Types*). The development of a theory of clutch performance is key to advancing the field of clutch performance, and such a theory should consider the temporal distinctions between clutch moments and clutch performance, the role of context, and the nature of emergent goals.

6.4.2 Measurement Implications

The refined definition and conceptualisation suggested that clutch performance is a subjective, contextually based phenomenon. Such a position has implications for the robustness of different approaches to measuring clutch performance. For example, it was reported in Chapter 2 (Study 1; Schweickle et al., 2020) that the majority of research within the field had used archival designs. Specifically, such designs involved examining objective performance in pre-identified pressure situations, in which pressure was assumed to be experienced by the athlete due to the presence of situational variables (e.g., Otten & Barrett, 2013). Findings from the current thesis, however, suggest that the awareness and appraisal of pressure may fluctuate throughout an event. Further, this pressure appraisal is not only influenced by situational factors, but also subjective factors, which may differ between athletes coming into an event (e.g., perceived expectations), as well as during the event (e.g., perceptions of performance). It was reported in Chapters 4 (Study 3) and 5 (Study 4), meanwhile, that athletes do not solely rely on objective indicators to assess clutch performance, but also draw on subjective performance indicators. As such, archival designs, in which a uniform experience of pressure and performance assessment is assumed, may overlook the subjective and contextual nature of clutch performance. Whilst archival designs can still

provide valuable insight into behavioural trends at an aggregate level (e.g., Jordet, 2009), it is important that if researchers endeavour to understand the processes underlying clutch performance, athletes' pressure appraisals and performance assessments are directly measured.

The development of a psychometric measure of pressure is required to advance the field of clutch performance. As discussed in Chapter 2, the majority of experimental studies examining clutch performance have drawn upon psychometric measures of anxiety to assess the experience of pressure (Gray et al., 2013; Gray & Cañal-Bruland, 2015; Otten, 2009). Whilst anxiety is often an indicator of pressure (e.g., Gucciardi & Dimmock, 2008), it was reported in Chapter 3 that not all athletes experience anxiety when appraising increased pressure. By only measuring anxiety, therefore, potentially relevant clutch performances may be overlooked, limiting our understanding of how clutch performances occur. An important barrier to directly measuring pressure, however, is that at present, no psychometric measure of pressure based on Baumeister & Showers (1986) conceptualisation exists. Given the prevalence and significance of the construct of pressure in sport and performance psychology (e.g., Low et al., 2020), this is relatively surprising, and appears critical to address. Indeed, a valid measure of pressure is fundamental to further understanding the relationship between pressure and anxiety, in addition to the development of a theory of clutch performance. Developing and validating a measure of pressure, therefore, is crucial to advancing both the fields of clutch performance and sports psychology more broadly.

The refined definition may provide a foundation for the development of a psychometric measure of clutch performance. Two central principles underlie this definition: (1) the appraisal of increased pressure compared to typical circumstances; and (2) the achievement of self-referenced, performance-related goals. These

continuous variables could be measured and positioned against each other to develop thresholds for clutch performance (i.e., the extent to which goals need to be achieved, and whether this achievement level differs as a function of the amount of pressure experienced). Indeed, clutch moments could also be examined within a performance, by measuring whether the athlete's primary performance-related goal was achieved, as well as assessing their pressure appraisal during a specific moment. Whilst the development of a measure of clutch performance is somewhat contingent upon a validated measure of pressure, such development is an important step in elucidating the key factors associated with clutch performances, and further, is fundamental to building and testing a theory of clutch performance.

6.4.3 Tripartite Distinction of Goal Types

Sports psychology practitioners have typically suggested using a combination of process, performance, and outcome goals for achieving optimal performance within sport (e.g., Kingston & Hardy, 1997). Indeed, the tripartite distinction of goal types is a fundamental concept within applied sport psychology (e.g., Williams, 2013). When applying this tripartite distinction to the findings reported within the current thesis, however, several conceptual issues were encountered. Specifically, common definitions of performance goals do not appear to consider emergent goals, which are typically short-term in duration and emerge out of the interaction between the athlete and the environment (e.g., Csikszentmihalyi, 2015). Rather, definitions of performance goals have centred on “end-products of performance” (Kingston & Wilson, 2009, p. 84), “improving the overall performance” (Munroe-Chandler et al., 2004, p. 60), and “increasing overall performance” (Burton & Weiss, 2008, p. 355). Accordingly, assessments of performance goal attainment have focused on the end-product of the

overall performance, which is typically compared against a pre-specified goal or previous standards (e.g., Gaudreau & Blondin, 2004).

Findings reported in Chapter 5, however, suggested that athletes often pursue, and assess their performance against, goals that emerge from performing within the event (e.g., to score a penalty). The focus on the overall performance product in traditional definitions of performance goals is the reason the terminology *performance-related goal* was employed within the refined definition, to allow for these emergent, and temporally shorter, performance goals. As such, definitions and assessments of performance goals should consider the role of emergent goals. Indeed, these emergent goals may also be relevant to a range of different goal types examined within goal setting research (e.g., specific goals; Locke & Latham, 2013). More broadly, the tripartite distinction of goal types is not based on theory (i.e., what goals work for whom under what conditions; Swann et al., 2020), an issue which appears in need of addressing if the tripartite distinction of goals types is to be used to as the foundation in goal setting interventions for athletes (e.g., Prestwich et al., 2015). Accordingly, the development of a theory underlying the tripartite distinction of goal types should account for the role of emergent goals.

6.5 Practical Implications

There are several implications for applied practice that can be drawn from this thesis. Practitioners may benefit from recognising that clutch performance is a goal dependent phenomenon. Specifically, it was reported in Chapter 5 (Study 4) that athletes assessed clutch performance based on the achievement of performance-related goals. It was demonstrated in Chapter 4 (Study 3), meanwhile, that achieving an outcome goal (i.e., winning) was not required for athletes to identify a clutch performance. Whilst performance-related goals still require a level of successful

performance, this is largely within the athletes' control, as opposed to outcome goals which "severely limit both their chances to achieve consistent success and their ability to take credit for that success because outcome goals are both uncontrollable and inflexible" (Burton, 1989, p. 106). When evaluating an individual's or team's performance under pressure, therefore, coaches and practitioners may similarly consider performance success based on performance-related goals, rather than outcome goals.

In evaluating performance based on goal achievement, practitioners may also benefit by recognising the role that emergent goals, and subjective performance indicators, play in athletes' assessments of clutch performance. For example, one method which practitioners have used to assess both objective, and subjective, performance is performance-goal discrepancy (e.g., Donovan & Williams, 2003). This method involves creating a performance score by subtracting the specific performance goal set before an event (e.g., a golfer setting a scoring goal for the first round) from their actual performance (e.g., the actual number of strokes played during the first round) (Frame & Reichin, 2019; Gaudreau & Blondin, 2004). Findings from this thesis, however, suggest that goals that emerge during the competition are significant in not only directing behaviour, but also assessing performance. As demonstrated in Chapter 5 (Study 4), athletes may set more subjective goals prior to a competition (e.g., doing your job), with the achievement of this goal assessed on the specific situations and performance goals that arise during the competition. Further, and as reported in Chapter 4 (Study 3), athletes also utilised subjective indicators (e.g., effort, perceived control) to identify clutch performances, which may not be reflected if performance is only assessed against a specific goal identified before the competition. When working with athletes to evaluate performance, therefore, practitioners may consider a more

contextual approach, in which emergent goals are considered, and subjective indicators of performance assessed.

In attempting to understand and facilitate performance under pressure, practitioners should consider that the influence of pressure on performance is dynamic and may result in a range of emotional experiences and coping responses. It was reported in Chapter 3 (Study 2; Schweickle et al., 2021) that both situational (e.g., the importance of the event, breaks in play), and subjective (e.g., expectations, perceived previous performance), factors influence the appraisal of pressure throughout an event. Once such pressure has been appraised, however, athletes reported experiencing a variety of responses. In some instances, athletes considered pressure as facilitative towards performance, and no negative emotional responses were reported. In other instances, athletes reported a sense of needing to manage the experience of pressure, which in some cases resulted in the experience of anxiety (i.e., a negative emotional response; Lazarus, 2000).

After experiencing anxiety, however, athletes reported engaging in further cognitive appraisals surrounding the relevance of the emotion to the performance, and how they may be able to cope with it (e.g., Fletcher et al., 2006). Specifically, some athletes reported interpreting anxiety as facilitative towards their performance, whilst other athletes engaged in coping strategies (e.g., self-talk, reframing) to manage the potentially debilitating effects of this anxiety. From an applied perspective, therefore, practitioners may benefit from recognising that the occurrence of clutch moments appears a dynamic and complex process, which involves multiple cognitive appraisals. As such, strategies to facilitate performance under pressure should consider these different appraisals, and endeavour to work with athletes to develop strategies for managing these.

6.6 Limitations and Future Directions

The findings from the current thesis should be considered with several limitations in mind. The sample recruited within Chapters 3, 4 and 5 (Studies 2, 3, and 4) primarily consisted of semi-elite athletes. Whilst a number of competitive-elite athletes were also recruited ($n = 4$ over Chapters 3 and 5), it is important to recognise that athletes competing at higher levels of expertise (e.g., successful elite or world-class elite; Swann et al., 2015) may perceive different, and unique, sources of pressure. For example, athletes may have to perform at certain standards to acquire or maintain funding (e.g., McKay et al., 2008), whilst world-class athletes may face high levels of public expectation (e.g., Hodge & Smith, 2014). Indeed, recent examples of the public scrutiny faced by athletes such as Naomi Osaka and Simone Biles after perceived underperformances at the Tokyo Olympics (Ronay, 2021) highlights the unique, and often intensely critical, contexts in which such world-class athletes operate. Whilst accessing a world-class elite sample presents barriers from a recruitment perspective, future research should aim to examine the experience of clutch performance in successful elite and world-class elite athletes (Swann et al., 2015) to gain a deeper understanding of this phenomenon.

The majority of athletes recruited in Chapters 3, 4, and 5 (Studies 2, 3, and 4) were drawn from Australia, and hence, the findings must be considered within this cultural context. Specifically, athletes from other cultures may have different perceptions of what clutch performance entails. For example, it may be the case that concepts such as pressure and performance are understood differently across other cultures, such as the suggestion that Eastern philosophies primarily view sport as a vehicle for moral and spiritual development (e.g., Jenkins, 2008). Indeed, even within Western cultures, how the concept of clutch performance is understood may differ. For

example, given the term *clutch* originated in North America (e.g., Safire, 2005), and the use of the term appears much more entrenched in American sporting vernacular and culture (e.g., West & Libby, 1969), how athletes from North America assess clutch performance may differ from athletes in Australia, New Zealand or the United Kingdom, where the term has only more recently been adopted. Future research should therefore expand investigations into athletes' understandings of clutch performance in a range of cultures.

The findings and subsequent conclusions of this thesis were grounded in a particular philosophical approach, namely critical realism (e.g., Maxwell, 2012). Whilst this critical realist approach is not a limitation in and of itself, it is important to recognise that other philosophical approaches may have resulted in different understandings of clutch performance (Evans et al., 2021). For example, the adoption of a relativist (e.g., Smith & Hodkinson, 2009) or naïve realist (e.g., Michell, 2003) approach may have resulted in a different interpretation of the data, and consequently, a different understanding of clutch performance. Future research should consider how the refined definition and conceptualisation of clutch performance align with different philosophical approaches.

To continue progress within the field of clutch performance, there are several future research directions that may be pursued, beyond those already discussed in detail (i.e., measurement and theoretical development). First, coaches' perspectives of what constitutes clutch performances for their athletes should be examined. Several athletes in Chapter 3 (Study 2; Schweickle et al., 2021) reported that the perceived expectations of their coach influenced their appraisal of pressure. Meanwhile, athletes in Chapters 4 and 5 (Studies 3 and 4) reported utilising feedback from coaches (e.g., direct feedback, or indirect feedback such as the number of minutes they received in a match) to help

identify and assess their clutch performances. Indeed, Jones et al. (2007) noted that an external viewpoint can facilitate a clearer understanding of a phenomenon. As such, coaches' perspectives of clutch performance should be examined to help test, and sharpen (Bunge, 2009), the refined definition and conceptualisation of clutch performance. Second, a deductive approach to testing the refined definition of clutch performance may be considered in future research. The development of the refined definition within this research program was a largely abductive approach (i.e., built upon athletes' experiences and perceptions of different aspects of clutch performance, and considered with previous definitions and theories in mind; Meyer & Lunnay, 2013). Now that such a definition has been proposed, a deductive approach could be utilised, in which the refined definition is tested directly with athletes to examine the extent to which it represents their understandings of clutch performance.

Lastly, based on the recommendations reported in Chapter 2 (Study 1; Schweickle et al., 2020), the empirical research reported in this thesis focused on clutch episodes (i.e., clutch performances and clutch moments). Also reported in Chapter 2, however, was that there is significant interest in the notion of clutch ability, and whether such a concept exists within sport. Following the proposition of a refined definition, this question may be revisited in future research. In line with this definition, such investigations may involve a more psychological and contextual approach to examining clutch ability, as opposed to previous investigations which have largely drawn on archival designs (e.g., Solomonov et al., 2015). In summary, future research avenues to increase understandings of clutch performance may involve examining external perspectives, adopting a deductive approach to data collection and analysis, and revisiting the notion of clutch ability.

6.7 Conclusion

This thesis reported on a program of research that examined the conceptual foundations of clutch performance. In examining this concept, athletes' perceptions of performing well under pressure were drawn upon. First, all empirical literature on clutch performance in sport and exercise was systematically reviewed, synthesised, and evaluated, to provide a foundation for the research program (Chapter 2; Study 1; Schweickle et al., 2020). The results reported in Chapter 2 indicated that there was considerable definitional, conceptual, and measurement heterogeneity within the field, which had resulted in conflicting evidence surrounding the extent to which clutch performance exists as an observable phenomenon, and further, how clutch performances may occur. Recommendations arising from this synthesis indicated that to resolve this heterogeneity, athletes' perceptions of performing well under pressure should be considered in shaping definitions of clutch performance. Chapter 3 (Study 2; Schweickle et al., 2021) reported that athletes perceived the "clutch" as an increased appraisal of pressure, and further, that such episodes fluctuated throughout an event. Given these different temporal appraisals, clutch moments were deemed to refer to a specific episode of increased pressure appraisal within an event, whilst clutch performance reflected an increased appraisal of pressure across the entire event. Chapter 4 (Study 3), meanwhile, reported that athletes drew on both objective (e.g., statistics), and subjective (e.g., perceived control), indicators of performance when identifying clutch performance. Accordingly, it was concluded that conceptualisations of clutch performance should allow for subjective interpretations of performance. Building on this finding, Chapter 5 (Study 4) reported that athletes primarily assessed clutch performance based on the extent to which they achieved their performance-related, self-referenced goals. Indeed, such goal achievement may have been assessed utilising both

objective, and subjective, performance indicators. Chapter 6 provided a discussion of these findings, and specifically, proposed a refined definition of clutch moments and clutch performance. Overall, this thesis represented the first program of research to investigate, consider, and refine the definition of clutch performance based on athletes' perceptions of performing under pressure. This refined understanding of clutch performance as a largely subjective, context-dependent phenomenon offers an avenue to develop measurement and theoretical explanations, which ultimately, will underlie the design of interventions and applied strategies to facilitate clutch performance in athletes.

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Appendix A: Thesis Format Agreement



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

I agree that the thesis submitted by the PhD candidate, Matthew Schweickle, has been prepared in journal article compilation style format.

Principle Supervisor: Dr. Stewart A. Vella	
Signature:	
Date:	20/08/2021
Co-Supervisor: A/Prof Christian Swann	
Signature:	
Date:	20/08/2021
Co-Supervisor: Dr Gregory Peoples	
Signature:	
Date:	17/08/2021
PhD Candidate: Matthew J. Schweickle	
Signature:	
Date:	14/08/2021

Appendix B: Statement of Contribution of Others



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OF WOLLONGONG
AUSTRALIA

As co-authors on at least one of the following papers:

1. Schweickle, M. J., Swann, C., Jackman, P. C., Vella, S. A. (2020). Clutch performance in sport and exercise: a systematic review. *International Review of Sport and Exercise Psychology*, 1–28.
<https://doi.org/10.1080/1750984X.2020.1771747>
2. Schweickle, M. J., Vella, S. A., & Swann, C. (2021). Exploring the “clutch” in clutch performance: A qualitative investigation of the experience of pressure in successful performance. *Psychology of Sport & Exercise*, 54, 101889.
<https://doi.org/10.1016/j.psychsport.2021.101889>
3. Schweickle, M. J., Swann, C., & Vella, S. A. (under review – revise and resubmit). Objective and Subjective Performance Indicators of Clutch Performance in Basketball: A Mixed Methods Multiple Case Study. Submitted to *Journal of Applied Sport Psychology*.
4. Schweickle, M. J., Vella, S. A., & Swann, C. (under review – revise and resubmit). Was it a Clutch Performance? A Qualitative Examination of the Definitional Boundaries of Clutch Performance. Submitted to *Psychology of Sport and Exercise*.

I declare that the greater part of the work is directly attributable to the PhD candidate, Matthew Schweickle, I confirm that the candidate has made contributions in the design of the research, data collection and analysis, and the writing and editing of the manuscripts.

As a supervisor or co-author, I have been involved in the formulation of research ideas and editing of the manuscripts.

Principle Supervisor: Dr. Stewart A. Vella	
Signature:	
Date:	20/08/2021
Co-Supervisor: A/Prof Christian Swann	
Signature:	
Date:	20/8/2021
Co-Author: Dr. Patricia C. Jackman	
Signature:	
Date:	17/8/2021
PhD Candidate: Matthew J. Schweickle	
Signature:	
Date:	14/08/2021

Appendix C: PRISMA Statement

Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement (PRISMA) checklist

<i>Section/topic</i>	<i>#</i>	<i>Checklist item</i>	<i>Reported on page #</i>
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3-7
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	7

<i>Section/topic</i>	<i>#</i>	<i>Checklist item</i>	<i>Reported on page #</i>
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n/a
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	7-9
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7-9 & Supplementary File 2
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	6-7 & Supplementary File 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8-9

<i>Section/topic</i>	<i>#</i>	<i>Checklist item</i>	<i>Reported on page #</i>
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	10
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	10
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	11
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	10
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	10
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	11
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n/a
RESULTS			

<i>Section/topic</i>	<i>#</i>	<i>Checklist item</i>	<i>Reported on page #</i>
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	11-12 & Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	12-13
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	11 & Supplementary File 3
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and confidence intervals, ideally with a forest plot.	Table 1
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	11-25
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	13 & Supplementary File 3
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	n/a

<i>Section/topic</i>	<i>#</i>	<i>Checklist item</i>	<i>Reported on page #</i>
<i>DISCUSSION</i>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).	25-26
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	33
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	23-34
<i>FUNDING</i>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	n/a

Appendix D: Database Search Strategy

Search strategy for each electronic database

#	Academic Search Complete	PsycArticles	PsycInfo	SportDiscus	Medline	SCOPUS	Pub Med	Web of Science (Core Collection)	Science Direct	ProQuest Central
1	.mp (clutch)	.mp (clutch)	.mp (clutch)	.mp (clutch)	.mp (clutch)	TITLE-ABS-KEY (clutch)	Title/Abstract (clutch)	TS (clutch)	Title, abstract, keywords (clutch)	noft (clutch)
2	TX (sport* OR exerci* OR physical* OR athlete*)	TX (sport* OR exerci* OR physical* OR athlete*)	TX (sport* OR exerci* OR physical* OR athlete*)	TX (sport* OR exerci* OR physical* OR athlete*)	TX (sport* OR exerci* OR physical* OR athlete*)	ALL (sport* OR exerci* OR physical* OR athlete*)	ALL (sport* OR exerci* OR physical* OR athlete*)	TS (sport* OR exerci* OR physical* OR athlete*)	All terms (sport OR sports OR sporting OR sportsperson OR exercise OR exerciser OR exercising OR physical OR physically)	ft (sport* OR exerci* OR physical* OR athlete*)
3	S1 AND S2	S1 AND S2	S1 AND S2	S1 AND S2	S1 AND S2	S1 AND S2	S1 AND S2	S1 AND S2	All terms (athlete OR athletic OR athletes OR athletically)	S1 AND S2

4	S3 Limit: Boolean/Phrase, Peer reviewed	S3 Limit: Boolean/Phrase, Peer reviewed	S3 Limit: Boolean/Phrase, Peer reviewed	S3 Limit: Boolean/Phrase, Peer reviewed	S3 Limit: Boolean/Phrase, Peer reviewed	S3 Limit: Document Type (Article, Article in Press)	S3 Article types: clinical study, clinical trial, journal article, observational study, randomized controlled trial, review	S1 AND S2	S3 Limit: Peer reviewed
5								S4 Limit: Research Articles	
6								S1 and S3	
7								S6 Limit: Research Articles	

Appendix E: Quality Assessment

Quality assessment of included studies.

Criteria, Author, Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total %
Birnbaum (2008)	1	1	2	0	2	1	1	1	NA	0	NA	1	2	NA	0	0	31%
Birnbaum (2009)	1	0	2	0	2	0	1	0	NA	0	NA	1	2	NA	0	0	23%
Brooks (1989)	1	1	3	0	2	0	2	2	NA	2	NA	1	3	NA	0	0	44%
Cao, Price, and Stone, (2011)	2	2	1	2	2	1	2	2	NA	2	NA	2	3	NA	0	0	54%
Cramer (1977)	1	1	2	0	2	0	0	0	NA	2	NA	2	2	NA	0	0	31%
Cramer & Palmer (2008)	1	3	3	0	2	1	0	1	NA	3	NA	2	1	NA	0	0	44%
Deane & Palmer (2006)	1	1	2	0	3	1	1	1	NA	3	NA	2	2	NA	0	0	44%
Gray and Cañal-Bruland (2015)	3	3	3	0	1	3	2	1	0	3	NA	2	2	NA	1	2	62%
Gray, Allsop, and Williams (2013)	3	3	3	0	1	3	2	1	1	3	NA	2	2	NA	0	3	64%
Hill and Hemmings (2015)	3	2	3	3	2	3	3	2	NA	NA	3	3	3	NA	0	3	85%
Hill, Carvell, Matthews, Weston, and Thelwell (2017)	3	3	2	3	2	3	3	2	NA	NA	3	3	3	NA	0	3	85%
Jackman, Crust, and Swann (2017)	3	3	2	1	2	3	3	2	2	3	3	3	3	NA	2	3	84%
Jackman, Crust, and Swann (in press)	3	3	3	0	3	3	3	2	2	3	3	3	3	NA	0	2	80%
Jetter & Walker (2015)	1	2	3	1	2	3	2	3	NA	3	NA	3	3	NA	0	1	69%
Maher, Marchant, Morris, and Fazel, (2018)	2	3	2	0	1	2	1	3	NA	NA	2	3	1	NA	0	2	56%
McEwan, Schmaltz, and Ginis (2012)	3	2	1	0	1	3	1	2	0	2	NA	3	1	NA	0	2	50%
Otten (2009)	3	3	2	0	1	3	3	2	3	3	NA	3	2	NA	0	2	71%
Otten & Barrett (2013)	3	2	3	1	3	3	2	2	NA	2	NA	3	1	NA	0	3	72%
Owens, Stewart, and Huebner (2016)	3	1	3	0	1	2	1	1	1	1	1	1	1	NA	0	0	38%
Ruane (2005)	1	1	1	1	3	1	1	2	NA	2	NA	2	2	NA	0	0	44%
Solomonov, Avugos, and Bar-Eli (2015)	3	3	3	0	2	3	2	3	0	3	NA	2	2	NA	2	1	74%
Swann, Keegan, Crust, and Piggott (2016)	3	3	3	3	2	3	3	3	0	2	3	3	3	NA	0	3	82%
Swann et al. (2017a)	3	3	3	3	3	3	3	2	NA	NA	3	3	3	NA	0	3	90%
Swann et al. (2017b)	3	3	3	3	3	3	3	2	NA	NA	3	3	3	NA	0	3	90%

Swann, Jackman, Schweickle, and Vella (2019)	3	3	3	2	3	3	3	2	NA	NA	3	3	3	NA	0	2	85%
Wallace, Caudill, and Mixon (2013)	1	2	3	0	3	1	1	0	NA	2	NA	3	2	NA	0	0	46%
Worthy, Markman, and Maddox (2009)	3	1	2	0	2	1	1	0	NA	2	NA	2	1	NA	0	0	38%

Notes: (i) In accordance with the quality assessment tool developed by Sirriyeh et al. (2012), the criteria for quality assessment are: (1) explicit theoretical framework; (2) statement of aims/objectives in main body of report; (3) clear description of research setting; (4) evidence of sample size considered in terms of analysis; (5) representative sample of target group of a reasonable size; (6) description of procedure for data collection; (7) rationale for choice of data collection tools; (8) detailed recruitment data; (9) statistical assessment of reliability and validity of measurement tools (quantitative only); (10) fit between stated research question and method of data collection; (11) fit between stated research question and format and content of data collection tool (e.g., interview schedule); (12) fit between research question and method of analysis; (13) good justification for analytical method selected; (14) assessment of reliability of analytical process (qualitative only); (15) evidence of user involvement in design; and (16) strengths and limitations critically discussed; (ii) The scoring criteria for the assessment tool correspond to the following labels: 0 = not at all; 1 = very slightly; 2 = moderately; and 3 = complete; (iii) criterion 14 was excluded from the quality assessment due to criticism of this strategy as an assessment of quality in qualitative research (Smith & McGannon, 2018); (iv) criterion 9 was excluded from the quality assessment for archival studies as it was deemed inappropriate by the authors of the current review

Appendix F: Ethics Approval

Monday, August 23, 2021 at 16:23:32 Australian Eastern Standard Time

Appendix G: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

A mixed methods investigation into performance under pressure in sport Dr Stewart Vella, Mr Matthew Schweickle, Dr Gregory Peoples, Dr Christian Swann

PURPOSE OF THE RESEARCH

This is an invitation to participate in a study conducted by researchers at the University of Wollongong. The purpose of the research is to investigate the psychological experience of athletes during improved performance under pressure in sport.

INVESTIGATORS

Dr Stewart Vella
Faculty of Social Sciences
02 4221 5516
stvella@uow.edu.au

Mr Matthew Schweickle
Faculty of Social Sciences
0425 207 335
mjs815@uowmail.edu.au

Dr Gregory Peoples
School of Medicine
02 4221 5172
peoples@uow.edu.au

Dr Christian Swann
School of Health and Human Sciences
02 6659 3063
Christian.swann@scu.edu.au

METHOD AND DEMANDS ON PARTICIPANTS

If you choose to participate, you will be invited to partake in a brief questionnaire and interview about your psychological experience during periods of increased performance under pressure. The questionnaire takes approximately 5 minutes and focuses on your perceptions of performance and pressure in a recent event or activity. In some cases, participants will be followed up to see if they would also be interested in taking part in an interview. Interviews typically last around 60 minutes, and can be conducted face-to-face, or via Skype or telephone. Interviews will take place as soon as possible after competing in an event. The interview will be conducted and audiotaped by a member of the research team. Typical questions include: “What was the experience like?”; “What things were you thinking and feeling?”; “During what moments in the performance did you feel pressure”; and, “How did you assess your performance?”. In addition to the interview, we may also seek to obtain objective data about your performance. This will be basic performance data and may differ depending on your sport. As a general guide, we are interested in your overall performance and how this compares to your previous best performances, your final place in the competition, and where appropriate, your lap or split times, or your performance in individual rounds. This data will be used to help guide the interview and explore your psychological experience during moments of increased performance. Both the questionnaire, interview, and provision of performance data are optional and entirely voluntary.

POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS

Apart from the time participating in the questionnaire and an interview, we can foresee no inconvenience to you. You will have the option to withdraw any data that you have provided. Your involvement in the study is voluntary and you may withdraw your participation from the study at any time by informing a member of the research team of your decision. The decision not to participate, or to withdraw from the study, will not affect any current or future relationships with the research team, University of Wollongong, or your sports organisation.

FUNDING AND BENEFITS OF THE RESEARCH

This study is not funded by any granting body. This research will help to understand the psychological experience of increased performance under pressure in sport. Findings from the study will be published

in psychology focused academic journals. Confidentiality is assured and you and the other participants will not be identified in any part of the research.

ETHICS REVIEW AND COMPLAINTS

This study has been reviewed by the Social Science Ethics Committee of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted you can contact the UOW Ethics Officer on (02) 4221 3386 or email rsoethics@uow.edu.au. Thank you for your interest in this study.

HOW TO PARTICIPATE

If you choose to participate, you can email or call Mr Matthew Schweickle to express your interest. If you have not yet competed in an event but have an upcoming event in which you feel you may be in a situation where increased performance under pressure is likely, we can organise to follow you up afterwards. If you have already competed in an event, we will organise a time to conduct an interview with you. You will be asked to sign a consent form before taking part in the study.

Version 3 14:08:2020

Appendix H: Consent Form

Consent Form

A mixed methods investigation into performance under pressure in sport Dr Stewart Vella, Mr Matthew Schweickle, Dr Gregory Peoples, Dr Christian Swann

I have been given information about the research project entitled “*A mixed methods investigation into performance under pressure in sport*” and had an opportunity to discuss the project with a member of the research team from the University of Wollongong.

I have been advised of the potential risks and burdens associated with this research, which include a potential time burden to respond to a questionnaire and in some cases, conduct an interview, and have had an opportunity to discuss this with a member of the research team, including any questions I may have about the research and my participation.

I understand that my participation in this research is voluntary, I have been invited to participate and I am free to withdraw from the research at any time. My non-participation or withdrawal of consent will not affect my relationship with the research team, the University of Wollongong, or my sports organisation.

If I have any enquiries about the research, I can contact Dr Stewart Vella on 02 4221 5516 or Matthew Schweickle on 0425 207 335, or if I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on 4221 3386 or email rso-ethics@uow.edu.au.

I understand that the data collected from my participation will only be seen by the research team, will be used for journal publications and may also be presented at sport psychology conferences. I consent for it to be used in that manner.

By signing below, I am indicating my consent to (please tick):

- Respond to a questionnaire about my perceptions of performance and pressure in a recent activity/event
- Participate in an interview about my experience of a recent activity/event
- Provide details around my performance in that recent activity/event, which will be used to help guide the interview if I take part
- Being audio recorded if I take part in an interview

Signed

Date

.....

...../...../.....

Name (please print)

Nationality

.....

Age

.....

14:08:2020

Gender

Male Female Other

Version 2

Appendix I: Screening Questionnaire

1. Overall, how well do you think you performed in this match?

Worse than my normal standard								Above my normal standard	
1	2	3	4	5	6	7	8	9	10

2. To what extent did you achieve your goal in this match

Did not achieve								Completely achieved	
1	2	3	4	5	6	7	8	9	10

Pressure in sport is considered the presence of situational incentives for optimal, maximal, or superior performance. Pressure is felt when athletes are both aware of, and motivated to, perform optimally in response to such incentives.

3. To what extent were you aware of the incentives to perform in this match?

I was not aware								I was completely aware	
1	2	3	4	5	6	7	8	9	10

4. To what extent were you motivated to perform well in response to these incentives for optimal performance in this match?

I was not motivated								I was completely motivated	
1	2	3	4	5	6	7	8	9	10

5. Overall, to what extent did you feel pressure in this event?

No pressure								The most amount of pressure I've felt in sport	
1	2	3	4	5	6	7	8	9	10

6. How much pressure would you feel in a typical match in this competition?

No pressure								The most amount of pressure I've felt in sport	
1	2	3	4	5	6	7	8	9	10

Appendix J: Case Reports

Case Report 1: Power Forward

Context: The situational context for this case was a must-win game to make the playoffs. Of specific note, their opponent was undefeated for the season:

they haven't dropped a game, like they haven't lost a game. So, they were kind of rolling in thinking it's another week, another week in the office, another win for them, against a team who's lost a couple... if we lost that our season was done.

Describing their experience of pressure prior to the game, Power Forward described feeling a similar amount of pressure to other competitive games, largely on account of a sense of perceived confidence by their teammates and coach:

I have the confidence from my coach and the guys in the team to kind of just do what I'm good at, so I don't really feel too much pressure playing in the group that we have... just the confidence I have from the coach, and the group of guys that I play with, I don't really feel much pressure when I play. That's a big thing for me, my attitude is always the same, never changes, it's a big thing for me... very similar, very, very similar to all the other games.

Accordingly, despite being a must-win game, Power Forward described appraising a similar amount of pressure to a normal competitive match within this league.

Table 1. Screening Questionnaire

Question	Scale	Response
Overall, how well do you think you performed in this match?	-5 (worse than normal) to 5 (above normal)	1
To what extent did you achieve your goals in this match?	-5 (did not achieve) to 5 (completely achieved)	5
To what extent were you aware of the incentives to perform optimally in this match?	0 (I was not aware) to 10 (I was completely aware)	10
To what extent were you motivated to perform well in response to these incentives in this match?	0 (I was not motivated) to 10 (I was completely motivated)	10
Overall, to what extent did you feel pressure in this match?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	5

How much pressure would you feel in a typical match in this competition? 0 (no pressure) to 10 (most pressure I have ever felt in sport) 5

Objective Performance. Power Forward's team won the game 95-81. As displayed in Table 2, Power Forward increased their objective performance in three domains: points; field goal percentage; and free throw percentage. The baseline distribution of free throw percentage, however, should be noted. Specifically, the standard deviation of Power Forward's season average for free throw percentage was 0. In no areas did Power Forward show decreased performance. Power Forward also played more minutes than normal. As such, in a range of key areas, Power Forward objectively increased their performance.

Table 2. Overall objective performance

	Mins/ Game	PTS/min	FGA/ min	FG%	FT%	AST/min
Season Average (SD)	20.2 (4.8)	.37 (.17)	.41 (.14)	.32 (.11)	.50 (0)	.07 (.11)
Case Performance	30	.73	.50	.47	1	.07
Z score	2.04	2.12	.65	1.36	-	0

As displayed in Figure 1, Power Forward performed above their season average in the first, second, and third quarter. With regards to the first quarter, Power Forward displayed increased points ($z = 2.07$), yet field goal percentage was maintained. However, in the second quarter, both points ($z = 4.80$) and field goal percentage ($z = 1.58$) were above Power Forward's season average. It is worth noting that z score for Power Forward's points per a minute in this quarter; almost reaching five standard deviations above their season mean. Indeed, this was the biggest increase of any case in the sense of *increased effort* (e.g., Solomonov et al., 2015). In the third quarter, both points ($z = 4.31$) and field goal percentage ($z = 5.99$) were above Power Forward's season average. Of note, Power Forward's field goal percentage was almost six standard deviations above the mean and was the biggest increase

in any of the cases in the sense of *increased skilled performance* (e.g., Solomonov et al., 2015). However, in the fourth quarter, Power Forward's points ($z = -2.13$) and field goal percentage ($z = -2.82$) both dropped below average. In summary, Power Forward increased both their *effort* and *skilled performance* during the second and third quarter of the game yet underperformed in the fourth quarter.

Figure 1. Chronological Psychological Experience and Objective Performance for Case 1.

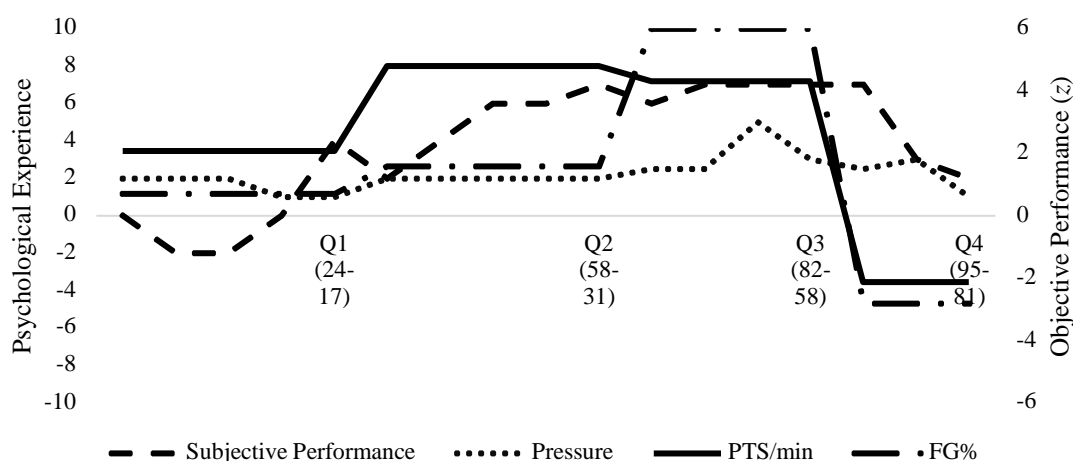


Figure 1. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

Subjective Performance. Overall, Power Forward rated their performance as a 1 (on a scale from 5 to -5). Power Forward noted that despite their noteworthy statistical increases, this represented the standard at which they felt they should be performing:

What I did on the weekend is the standard where I see myself at in this league. That was probably a little bit above, I played a great game, I played above how I've been playing, but I think the level that I played on the weekend is the level that I want to hold myself to in this league, and the personal that I'm playing against, that, that's a level that I can really hold it at.

Indeed, this seems to reflect a view that Power Forward's statistical increase may have been attributable to a sense of underperformance in the season thus far, and that this performance was in line with Power Forward's expectations for themselves.

Despite a relatively low performance rating, Power Forward reflected that they completely achieved their goals. Reflecting on these goals, Power Forward noted:

Definitely got to win. There's always that thing you got to win. Every week you come, never to lose, always to win. But for me defensively for me, you have to come with a mindset that you're going to play D [defence], because I get a bit lazy on defence... start playing defensively really well, and my offense will come after that, and just do the little things that I have to do to make us win, that's all... not really like a numeric thing, I'm not trying to get this many rebounds, or this many steals, I'm just trying to keep my guy that I'm guarding just to not score the ball. Not a figure, I'm just trying to do my part in our defence to try to win

Meanwhile, regarding their in-game performance, Power Forward noted: "I was really good through the middle of the game, but probably the first 5 minutes and last 5 minutes I was really poor. But other than that, I think I had quite a good overall performance". Indeed, this reflection is captured in Figure 1, in which Power Forward's subjective performance was highest in the second and third quarters, mirroring their objective performance. Indeed, this positive performance during the game, in addition to the score difference, also appeared to lower Power Forward's pressure appraisal as the game progressed:

in that second quarter when I moved forward my performance started improving a little bit, probably cause I was playing a little bit better, I was kind of doing everything I wanted to do at a higher level, the pressure was low, but my performance was definitely improving.

In summary, Power Forward's subjective performance peaked within the second and third quarter and was lowest in the first and fourth quarters.

Was this a Clutch Performance? Reflecting on whether this was a clutch performance, Small Forward reflected:

I definitely think some aspects of the game, like the way I came and scored at a good level, and did things at a good level, was definitely a clutch performance for me, but other aspects of the game, and the mistakes I made, I wouldn't put under clutch performance, but that's the game. But I definitely think the change of coming, and like you said, a spike in scoring, a spike in stats, was definitely a clutch performance in that game, yeah definitely.

Evident in this reflection is a recognition that there were aspects of the game that may have not fallen under the notion of clutch performance. However, it appears that as an overall reflection, and when considering the situational circumstances of the game, Power Forward considered this a clutch performance. Indeed, this is even more apparent when considering that the performance in the fourth quarter appears to have dropped from a lack of pressure, rather than increased pressure:

Um, I kind I thought I was just a little bit lazy, to be honest. I just kind of got to the end of the game, I kind of knew I was going to get subbed out because we were putting all our guys who didn't play a lot on at the end, I was just kind of getting lazy, like I just was, probably wasn't taking the best shots, just taking the ones that were there, but probably could have got a better shot. just being lazy really. Came to the end of the game, we're still winning, we're going to win. I was kind of a bit lazy.

Reflecting further on what constitutes a clutch performer, Small Forward noted:

I think to be a clutch performance, for me, is being able to put your hand up to hit the big shots. But kind of thinking about it, it's overcoming different changes that happen

late in the game, so like different ways that the other team are trying to throw you off your game, but you have the ability to like, bounce off changes and still excel, and still be efficient in what you're doing. Definitely you have to be the one to put their hand up and hit the big shot, to be a clutch performer to me, but you also need to be know maybe this time you're going to get it, but they might double team you, you've got to hit someone else, like knowing the changes, and being efficient at whatever they throw at you in the game... .. but it's the person who makes the right decisions moving into the latter parts of the game.

Case Report 2: Centre #1 (Semi-Final)

Context. The performance context of Centre #1 was a semi-final, in which the winner advanced to the grand-final to take place the following day. As displayed in Table 3, Centre #1 reported feeling slightly more pressure than a normal competitive game. This pressure was fuelled by dual motivations for this event. Firstly, and most strongly, there was a desire to beat the other team due to personal reasons:

they're a fantastic team. And so, the pressure came from knowing that, at any time, any one of them could just pop off and burn us really. So that, and I've had a bit of a sorted past with them. When I was playing at a different Association, we got into a couple heated fights. So, I'm more like, well, I really want to beat these guys, you know. So, there was a lot of extra pressure from myself

Second, there was also the incentive of making a grand-final: "we get to go to the Grand Final if we win this game. But it was important, but not more important than me just wanting to beat them". Centre #1 reported that prior to the performance, this pressure manifested in a sense of excitement, rather than anxiety of stress:

the fact that I was in the semi's was, um, yeah, got me excited. Hopped up on adrenaline. And then, you know, once I got into the game, yeah. Yeah. So, excitement. Buzzing... Not too much of any negatives

In summary, the context for this case was an elimination semi-final, in which Centre #1 felt more pressure than normal from multiple sources, yet this pressure was interpreted in a positive manner.

Table 3. Screening Questionnaire

Question	Scale	Response
Overall, how well do you think you performed in this match?	-5 (worse than normal) to 5 (above normal)	-2
To what extent did you achieve your goals in this match?	-5 (did not achieve) to 5 (completely achieved)	5
To what extent were you aware of the incentives to perform optimally in this match?	0 (I was not aware) to 10 (I was completely aware)	4
To what extent were you motivated to perform well in response to these incentives in this match?	0 (I was not motivated) to 10 (I was completely motivated)	7
Overall, to what extent did you feel pressure in this match?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	6
How much pressure would you feel in a typical match in this competition?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	5

Objective Performance. Centre #1's team won the semi-final 76-73. As displayed in Table 4, Centre #1 displayed increased objective performance for the game in three indicators: points; field goals attempted; and free-throw percentage. Accordingly, across the entire performance, Centre #1 displayed increased performance in three key objective indicators of clutch performance

Table 4. Overall Objective Performance

	Mins/ Game	PTS/min	FGA/ min	FG%	FT%	AST/min
Season Average (SD)	20 (5.68)	.41 (.21)	.26 (.13)	.62 (.19)	.63 (.40)	0 (0)
Case Performance	6.48	.77	.46	.67	1	0
Z score	-2.38	1.73	1.54	.23	.92	-

As displayed in Figure 2, Centre #1's performance reached the highest point during the fourth quarter. Specifically, Centre #1's attacking output, as measured by points per a minute, was almost four standard deviations above their season average ($z = 3.91$). This increased attacking output in the fourth quarter was also reflected in an increased in skilled performance, with field goal percentage almost two standard deviations above the mean ($z = 1.96$).

Figure 2. Chronological Psychological Experience and Objective Performance for Case 2

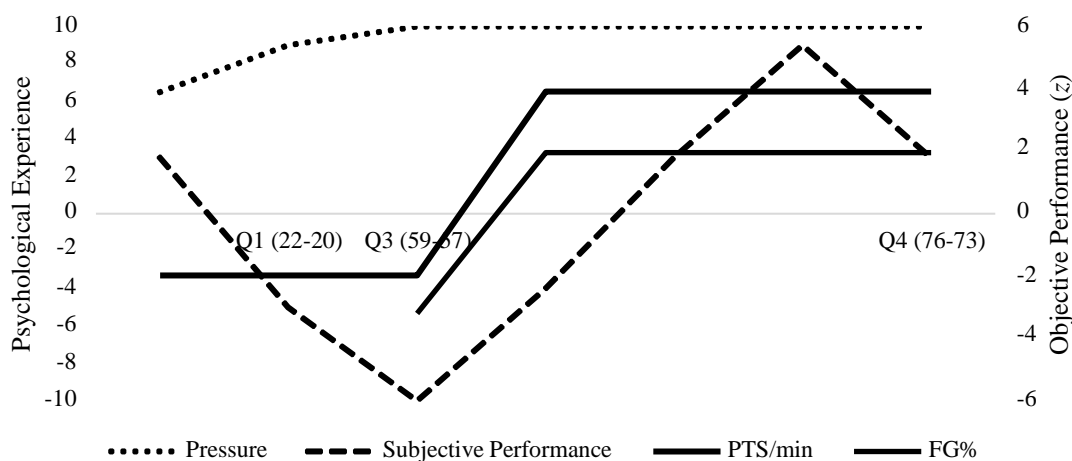


Figure 2. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

Subjective Performance. Reflecting on their overall performance, Centre #1 reported that their performance was below their normal standard, rating it -2 (on a scale between -5 and 5). Centre #1 reflected that in comparison to the last time they had played them, they had underperformed: “The last time we versed them, I had 12 rebounds, nine points or something like that. So, you know, definitely not, not up to my standards”. There also appeared a number of moments within the performance that contributed to this assessment:

I got in about the third quarter, missed an easy layup. And after that, I was just like, a bit of a mental, mental block. And I started the game with two fouls as well, in about a minute. So, you know, I was disappointed with myself

Indeed, the context of the game appeared to influence the appraisal of the referenced missed layup, with Centre #1 reflecting: “they had a little bit a of 4-0 run, and I could have capped off the quarter with, you know, a two point and yeah, just an easy gimme”. In sum, Centre #1 reported that in regard to their overall performance, they underperformed.

Despite Centre #1 feeling like they underperformed overall, Figure 2 displays that in the fourth quarter, subjective performance peaked, and almost reached the top of the scale (i.e., 9/10). Specifically, this occurred during a play where Centre #1 made a free-throw to extend the lead by 3 points, after drawing the foul on a 2-point play (i.e., totalling a 3-point play). Reflecting on this, Centre #1 noted:

It was definitely a lot of pressure, because I remember that play specifically, one of our players drove into the teeth of the defence and I was just there, wide open. I put a lot of pressure on myself when I’m wide open. And if I don’t make that shot, I’m like damn, you know, I get really down on myself... [in reference to the free throw] if I could go higher than 10 [pressure] I’d definitely go higher... all that’s going through my mind is “yep, I’m going to make this, I’m going to make this, I’m going to make this”. You know, repetition at the free throw line is key, in any situation... hitting that free throw put me up to a 9 or 10 [performance], honestly.

In summary, Centre #1 reflected that they thought overall they underperformed, and whilst there were subjective peaks during the performance, there were also periods where performance was considered much lower than normal.

Was this a Clutch Performance? Reflecting on if this was a clutch performance, Centre #1 reported:

No, I don't think it really was a clutch performance for me, honestly. I didn't really involve myself in, in any sort of specific play, or any type of run during the, during that fourth quarter. So, I can't really say it was a clutch performance. Yeah, it's just a normal game.

Evident from this quote is that Centre #1 considered clutch performance in this game to occur during the fourth quarter, where pressure was highest: “the fourth quarter is really where everything matters. You know? So definitely, probably at a 10 out of 10... a lot, a lot pressure”. As such, Centre #1's reflection of clutch performance appeared to focus on their fourth quarter performance. In contrast, however, all subjective and objective indicators (see Figure 2) of performance would indicate that Centre #1 performed best in the fourth quarter, performing both subjectively well, and above their season average in key statistical indicators. Indeed, it appears the case that even though the fourth quarter was their highest performance in both an objective, and subjective, sense, Centre #1 felt they had not reached the threshold for clutch performance:

Interviewer: So even though you, kind of, I guess, achieved that goal that you wanted to, it's kind of because you didn't perform to the, to the level you thought you should to kind of meet that clutch performance standard?

Centre #1: Yeah, absolutely.

This assessment of clutch performance may tie to the factors Centre #1 drew on to assess and evaluate their performance in the semi-final, reflecting:

Centre #1: It's more looking at my plus minus type stuff. Plus, minus, some stats, I rate it based on my energy as well. Yeah, the energy I bring on the court. Ah, so that sort of stuff. It's both on the stats, and what I do, that doesn't show up, the intangibles, type of thing.

Interviewer: So, I guess, reflecting on that combination between both for the semi-final, you just felt like you weren't up to that standard?

Centre #1: Yeah, absolutely.

In summary, whilst objectively it would appear that Centre #1 would have had a clutch performance (as they increased their performance), Centre #1 reflected that this wasn't a clutch performance, as they did not reach the threshold they thought was necessary. Indeed, Centre #1 did not reflect any specific moments which represented clutch performance (i.e., clutch moments) either.

Case Report 3: Centre #2 (Grand Final)

Context: The situational context of case Centre #2 was a grand final. As displayed in Table 5, Centre #2 reported feeling more pressure than a normal competitive match, and more pressure than the semi-final. Reflecting on this, Centre #2 noted:

I was aware that it was a grand final game, so, this is basically do or die. It's all or nothing at this point. So, you know, well, okay, well, I have to be motivated to this. If I can't motivate myself to play in the grand final, I don't think anything can. So, you know, the, the incentive is, at the end of the game is, if we win, we get to hang a banner up in the rafters.

However, this pressure was also mitigated by their role in the team, and feeling that the expectation was not on them to be the key player:

the pressure is there, but it wasn't as high for me knowing my role in the team as well. So, I can't say that it was a 10 out of 10... If I had known that I was going to play, you know, that 39 [minutes], like you said, I would have absolutely felt that pressure.

Compared to the semi-final performance (i.e., Case 2), Centre #2 reported the experience of pressure resulting in a more anxious emotional response, as opposed to excitement:

“definitely a lot of, lot of ah, lot of nervousness. Not, not the good type of nervousness”.

Table 5. Screening Questionnaire

Question	Scale	Response
Overall, how well do you think you performed in this match?	-5 (worse than normal) to 5 (above normal)	3
To what extent did you achieve your goals in this match?	-5 (did not achieve) to 5 (completely achieved)	-5
To what extent were you aware of the incentives to perform optimally in this match?	0 (I was not aware) to 10 (I was completely aware)	10
To what extent were you motivated to perform well in response to these incentives in this match?	0 (I was not motivated) to 10 (I was completely motivated)	10
Overall, to what extent did you feel pressure in this match?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	7
How much pressure would you feel in a typical match in this competition?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	5

Objective Performance. Centre #2's team lost the grand final 83-73, despite leading at the beginning of the fourth quarter by 1 point. As displayed in Table 6, Centre #2 demonstrated increased performances in three areas: points; field goal percentage; and assists. The standard distribution of the season average for assists, however, should be noted. Therefore, across the entire performance, Centre #2 displayed increased performance in three key objective indicators of clutch performance (e.g., Solomonov et al., 2015).

Table 6. Overall objective performance

	Mins/ Game	PTS/min	FGA/ min	FG%	FT%	AST/min
Season Average (SD)	20 (5.68)	.41 (.21)	.26 (.13)	.62 (.19)	.63 (.40)	0 (0)
Case Performance	17.42	.63	.34	.83	0.5	.06
Z score	-.45	1.05	.62	1.09	-.32	-

As displayed in Figure 3, Centre #2's objective performance peaked in both the first quarter and third quarter. In the first quarter, Centre #2's points per a minute was over two standard deviations above their season average ($z = 2.27$), whilst field goal percentage was just under two standard deviations above their season average ($z = 1.96$). However, this may partly be attributed to Centre #2 only having one field goal attempt in the first quarter (which

was successful) and playing relatively low minutes (2.27 minutes). In the third quarter, Centre #2's points per a minute was over two standard deviations above their season average ($z = 2.37$). However, this largely appeared a product of taking more field goal attempts, as Centre #2's field goal percentage remained within a standard distribution ($z = 0.26$).

Figure 3. Chronological Psychological Experience and Objective Performance for Case 3.

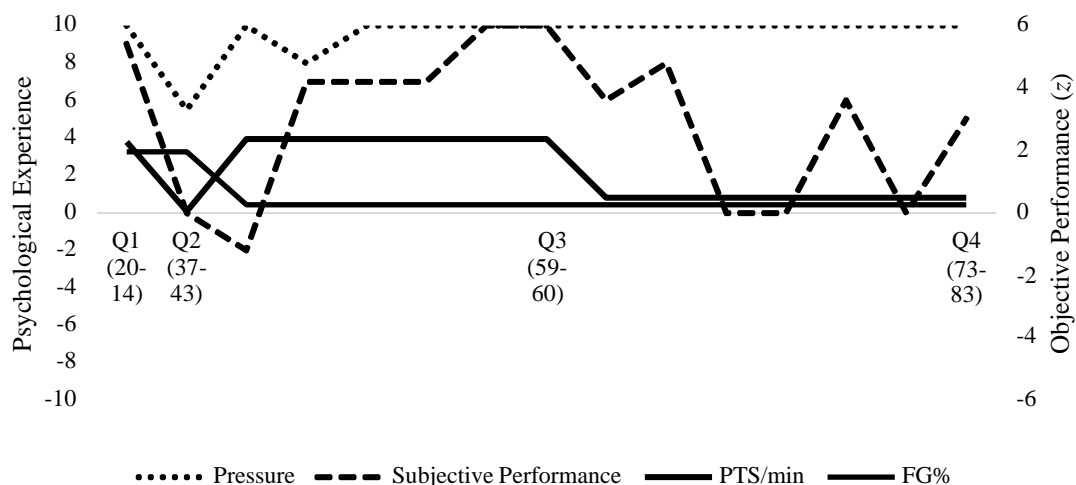


Figure 3. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

Subjective Performance. When reporting on their overall performance, Centre #2 reflected that they performed above their normal standard, rating it 3 (on a scale between -5 and 5). Centre #2 reflected that using their season average as a benchmark, they believed they improved their performance: “I scored more than my season average. So, I was more of a, more of a threat basically on the court, than I usually am”. Of note, in the previous case from the same participant (Centre #1), they discussed that they used the last time they had played their opponent as the benchmark to compare their performance against, rather than their season average. Centre #2, however, also discussed drawing on other factors to assess their performance: “there's definitely other factors in terms of rebounding, intangibles, things like that”. In sum, Centre #2 reported that in regard to their overall performance, they perceived performing better than normal.

Centre #2's within-game subjective performance peaked in the first and third quarter, which aligned with their objective performance. In regard to the first quarter, Centre #2 discussed feeling like they started game well, in particular the fact that they had a difficult match-up with a National Basketball League (i.e., national first league) player: "Definitely [performing] above my standard". In regard to the third quarter, Centre #2 reported performing at their maximum level, in addition to experiencing an optimal state:

10 out of 10 pressure, and I'd definitely that's a 10 [out of 10] performance. That's me playing above, well above, my standard... getting involved more on offence and making the right decision basically. Usually, in other situations, or in previous games, I'd probably try to force the shot there... I'm feeling fantastic. I'm like, you know, I'm making shots, I'm making good reads, I'm doing everything right. I'm like, yep, I can. I'm definitely in the zone

In summary, Centre #2 reported feeling like they were performing at their maximum, or near their maximum, at multiple moments within the match.

Was this a Clutch Performance? Reflecting on if this was a clutch performance, Centre #2 reported:

Last time we played them, I had a [expletive] poor performance. So, coming into this one, playing the way I did, I felt like I put my team in a position where we could have taken it all. I did everything that I could have done. I definitely can't say that - looking back, I can't say, you know, if I had done more, if I had done this, if I'd done that, we could have won that one. So that, that's clutch for me, you know, doing, doing everything I could have done, to put us in that position to take it all.... just doing everything I could have done possible to get us over the finish line. I'm not going to say I'm ecstatic with my performance. But you know, I think I was clutch when I needed to be.

Accordingly, Centre #2 appeared to assess clutch performance on a number of factors, including reflecting on past performances, as well as a sense of they had done everything they could. Reflecting specifically on what kind of performance indicators (i.e., objective or subjective indicators), Centre #2 noted:

It's more about the intangibles. Things that don't show up, basically, but you know, they help the team win... So that's basically how I, how I assess myself, yeah, yeah. Things that won't show up on the stat sheet but other teams, other players, other coaches, they look at and go, [expletive], I want that guy on my team.

When discussing performing in the fourth quarter, in which Centre #2 had previously identified as a key period for clutch performances (and further, as the score was close throughout the fourth quarter, Centre #2 had appraised the entire quarter as maximum pressure), Centre #2 reflected:

I've put myself in a position to win. So I'm just going to do what I've been doing all year. You know, I'm not going to try to do anything too much. Just put, put other people in a position to win, basically... my definition of clutch in that moment for me would be to, to put [teams key player] in a position where he can go off, basically

In summary, Centre #2 reported both increased objective and subjective performance compared to normal. Specifically, Centre #2 identified this match as a clutch performance due to a sense that they had done everything they could to win the performance, both based on objective indicators and subjective indicators.

Case Report 4: Small Forward #1 (Semi Final)

Context: The situational context of Small Forward #1's performance was a semi-final, in which the winner advanced to the grand-final to take place the following day. As reported in Table 7, Small Forward #1 reported feeling more pressure than a normal

competitive game. Specifically, this pressure resulted in the experience of anxiety before the game:

I was so anxious. So nervous. Um definitely more nervous, than the Grand Final.

There's just a lot of pressure for that game, because if you, like, especially because we were undefeated as well.... I really just didn't want to experience that feeling again.

So, for me, I was pretty anxious about playing that game and even playing the team that we had comfortably beaten. You still just don't know what's going to happen on the day... I've sort of been in multiple positions where I've been disappointed in the semi-finals, or the grand-final, and I was like, I just don't want to feel that way.

Despite feeling anxious before the game, Small Forward #1 reflected that they felt they had the resources to cope such an emotion:

I'll say three years ago, probably, would have been a 10 out of 10. Just because I have been playing for a really long time. And, and I've played in multiple situations like that. So, I kind of was like, yeah, I'm stressed. But like, I know what it takes to get to that, to that Grand Final.... I was like, I know what I need to do, and I've been here before, so I can be pretty level-headed. But still stressed.

In summary, the context for this case was an elimination semi-final, in which Small Forward #1 appraised more pressure than normal, which resulted in the experience of anxiety before the event. However, Small Forward #1 reported feeling that they had the ability to cope with such emotions and the situation, based on their previous experience in similar situations.

Table 7. Screening Questionnaire

Question	Scale	Response
Overall, how well do you think you performed in this match?	-5 (worse than normal) to 5 (above normal)	1
To what extent did you achieve your goals in this match?	-5 (did not achieve) to 5 (completely achieved)	2
To what extent were you aware of the incentives to perform optimally in this match?	0 (I was not aware) to 10 (I was completely aware)	8

To what extent were you motivated to perform well in response to these incentives in this match?	0 (I was not motivated) to 10 (I was completely motivated)	8
Overall, to what extent did you feel pressure in this match?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	7
How much pressure would you feel in a typical match in this competition?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	4

Objective Performance: Small Forward #1's team won the semi-final 66-57. As displayed in Table 8, Small Forward #1 displayed increased objective performance in field goal attempts. In relation field goal percentage, however, they displayed decreased objective performance. As such, Small Forward #1's performance may be described as increased effort (i.e., taking more shots), yet demonstrated lower skilled performance (i.e., percentage of successful shots).

Table 8. Overall Objective Performance

	Mins/ Game	PTS/min	FGA/ min	FG%	FT%	AST/min
Season Average (SD)	16.42 (3.78)	.38 (.24)	.38 (.08)	.35 (.19)	.89 (.28)	.06 (.06)
Case Performance	14.62	.27	.54	.13	1	0
Z score	-.48	-.46	2.50	-1.21	.39	-1.00

As displayed in Figure 4, Small Forward #1's performance peaked in the first quarter, in which both points per a minute ($z = 3.70$) and field goal percentage ($z = 3.5$) were above season average. However, this was likely a product of Small Forward #1 only attempting one shot in the first quarter and playing a relatively low number of minutes (1.6 minutes). Throughout the remainder of the performance, Small Forward #1's objective performance generally was below, or within, their season average. Specifically, field goal percentage decreased for the remainder of the performance ($z = -1.89$), whilst points per a minute were lower than their season average in both the second and third quarter ($z = -1.62$). In summary,

Small Forward #1's objective performance was generally worse than, or within, their season average, for this performance.

Figure 4. Chronological Psychological Experience and Objective Performance for Case 4

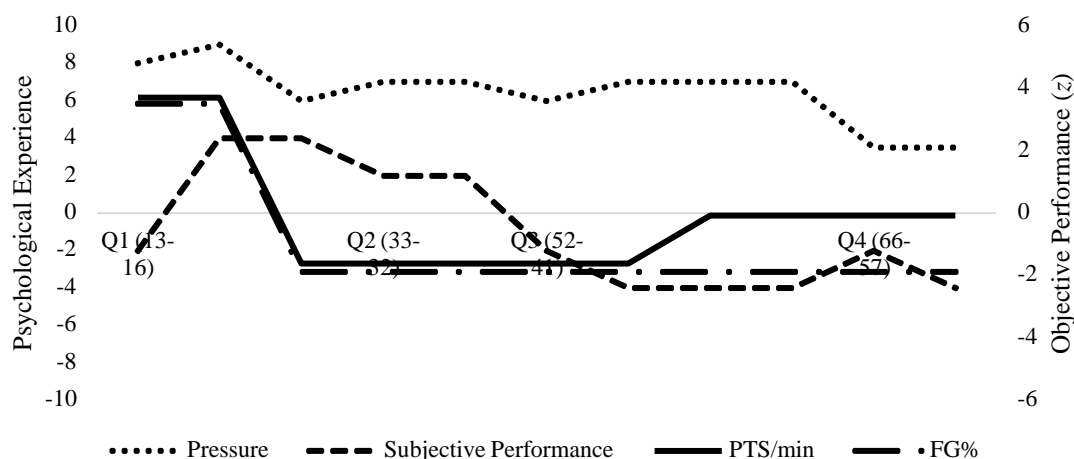


Figure 4. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

Subjective Performance. Reflecting on their overall performance, Small Forward #1 reported performing slightly above normal, rating it a 1 (between -5 and 5). Explaining this, Small Forward #1 noted that whilst they felt they did enough on the defensive side of the game, and did enough to win the game, they felt they underperformed offensively: “Defensively good, but like offensively, I kind of personally, I thought I let myself down”. Reflecting further on this, Small Forward #1 noted that this may have also been as a result of good defensive play by the opposing team:

I'm usually quite good on the offensive boards, and I didn't get any of those. Which I think, to be fair, I think [opposition team] were very aware of that. So, they had probably scouted pretty well... did such a good job of trying to disrupt our style of play, but at the end of the day, I think experience sort of prevailed.

Within the game, Small Forward #1's subjective performance progressively dropped.

Subjectively, Small Forward #1's performance peaked in the first quarter, during which time they also appraised the most pressure:

I'm always more nervous to checking in for the first time of the game, definitely, and then especially at that point, where the scores were level, and no one was kind on the front foot in terms of taking control of the game... most stressed at that first time stepping onto the court.

Specifically, this subjective performance aligned with their best objective performance within the game, in which they hit a two-point field goal: "I was happy I hit it. Always a good feeling to hit a shot early in the game. Once I hit one, I know the rest should be fairly straight forward, although it wasn't". As the game progressed, however, Small Forward #1's subjective performance lowered, primarily due to missing field goals they felt they would normally make, which also contributed to their appraisal of pressure:

I'm at the top of the key and I'm like, oh I haven't hit the shot that I usually hit, and now I'm taking one from the top, which I don't typically take... because I had already missed a pretty easy, straightforward shot for me. So, yeah, the pressure definitely went up

In summary, whilst overall Small Forward #1 reported performing slightly above normal, they only had small periods in the game where their subjective performance was viewed positively.

Was this a Clutch Performance? Reflecting on whether they believed this performance constituted a clutch performance, Small Forward #1 stated:

Personally, probably no clutch performance... I think, yeah, didn't really have a great performance. Definitely not clutch... I think we were, definitely deserved to come away with the win, but it wasn't a great performance overall. Yeah, I don't even

really think, there's nothing really like in my mind in terms of anything standing out from the game... just a grind, I think.

Indeed, this reflection appears to align with Small Forward #1's objective indicators of performance, which overall showed a decreased in skilled performance, whilst for the majority of the game, objective performance indicators were below their season average.

Case Report 5: Small Forward #2 (Grand Final)

Context: The situational context for this case was a grand-final. As displayed in Table 9, Small Forward #2 reported feeling more pressure than normal competitive circumstances, and more pressure than their semi-final the previous day (i.e., Case 4 - Small Forward #1). Reflecting on this, Small Forward #2 reported that whilst they appraised more pressure before this game, the emotional experience was different than before the semi-final:

Small Forward #2: I just didn't feel as anxious because we'd gotten there. So, all we had to do was just win the game. I put an 8 because of the opposition, who I think is quite skilful... So, I was a bit stressed because I wasn't sure what they were going to throw at us... and also, still being undefeated we were like, oh my god, if we could get all the way to the grand-final and then lose the grand-final that would be the worst feeling in the world. There was that as well.

Interviewer: Ok, so kind of more pressure leading into the grand-final than the semi, but maybe not as like, anxious or nervous as the semi-final?

Small Forward #2: Yeah, definitely. Definitely.

Accordingly, Small Forward #2 reported increased pressure appraisal for this game, yet less anxiety compared to the semi-final.

Table 9: Screening Questionnaire

Question	Scale	Response
Overall, how well do you think you performed in this match?	-5 (worse than normal) to 5 (above normal)	2

To what extent did you achieve your goals in this match?	-5 (did not achieve) to 5 (completely achieved)	5
To what extent were you aware of the incentives to perform optimally in this match?	0 (I was not aware) to 10 (I was completely aware)	9
To what extent were you motivated to perform well in response to these incentives in this match?	0 (I was not motivated) to 10 (I was completely motivated)	9
Overall, to what extent did you feel pressure in this match?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	8
How much pressure would you feel in a typical match in this competition?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	4

Objective Performance. Small Forward #2's team won the grand-final 81-71. As displayed in Table 10, Small Forward #2 demonstrated no objective increases in performance compared to their season average. Indeed, Small Forward #2 performed lower than their season average in points per a minute. Overall, therefore, there was no evidence of an objective increased in performance, and indeed, in one key areas, there was actually a decrease.

Table 10. Overall objective performance

	Mins/ Game	PTS/min	FGA/ min	FG%	FT%	AST/min
Season Average (SD)	16.42 (3.78)	.38 (.24)	.38 (.08)	.35 (.19)	.89 (.28)	.06 (.06)
Case Performance	17.52	.11	.34	.17	-	.11
Z score	.29	-1.14	-.07	-.99	-	.88

As shown in Figure 5, Small Forward #2's within-game objective performance never exceeded their season average. In both the first and third quarter, this was attributable to a lack of involvement in attacking statistics, specifically that no field goals were attempted. Meanwhile, objective performance during the second quarter remained within a standard deviation of Small Forward #2's season average, whilst in the fourth quarter, objective performance was lower in both points ($z = -1.62$) and field goal percentage ($z = -1.89$).

Accordingly, there were no increases in performance, compared to season average, during any quarter.

Figure 5. Chronological Psychological Experience and Objective Performance for Case 5.

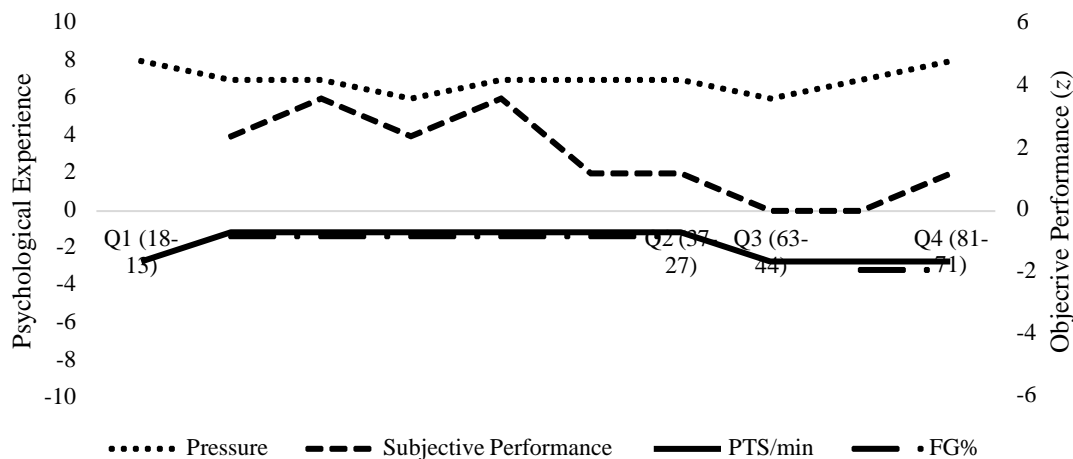


Figure 5. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG%, and scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

Subjective Performance. Reflecting on their goals for the game, Small Forward #2 noted that: “My goals, coming into the game, obviously to win. And to shoot well from three would be good, and also to play really good defence and limit my fouls”. Small Forward #2 did report that they achieved their goals for the game (rating it 5/5), and also reflected that overall, they felt they performed above their normal standard, rating the performance 2 (on a scale between -5 and 5). Reflecting on their performance, Small Forward #2 noted:

the shots did not happen, I think I shot terribly again. I think I was like one of eight, or one of nine or something. Maybe two. And then the fouls I think I was much better. Yeah, so I was happy with the way I played with that, yeah.

However, Small Forward #2 reflected that they felt they did things that may not have occurred on the statistics they meant they felt they performed well: “I think I was just starting to feel like I can control [the situation]”.

Within the performance, there were a number of moments of positive perceived performance. In the second and third quarters, subjective performance appear to be evaluated largely on their overall contribution to the game, and not on key objective indicators (such as field goals): “I think like, after I do a couple little things that aren't offensive, like, that are assists or a rebound, I like to, I feel pretty good. And I'm like, let's take this shot, and it'll go in”. As such, even though from an objective viewpoint Small Forward #2 was underperforming, they still felt positive above their performance. This was largely due to the perceived confidence in them from their coach:

I kind of know that like [the coach] leaving me in, and he put me in quickly. And so, I must be doing something right. I must just be like, doing things that maybe aren't showing on the stats and that kind of thing. So, in a way, I'm still pretty happy with how I'm playing because I must be doing something right because I'm staying on the court.

Indeed, as the game progressed to the fourth quarter, Small Forward #2 reflected on their mentality which contributed to their performance assessment: “I was pretty happy just remaining in control of the game... keep it controlled and not turn the ball over”. In summary, Small Forward #2 largely reported feeling like they were performing better than normal over the game.

Was this a Clutch Performance? Reflecting on whether this performance constituted as a clutch performance, Small Forward #2 noted:

Definitely more of a clutch performance than the semi. And probably I think, or me personally, definitely not stats wise, but little things that contribute to the overall tone of the game. So, I think for me, I had a more clutch performance, um, just in terms of being level-headed and showing experience, and yeah, that kind of thing... I mean, I

can tell, when like [the coach] puts me on a bit more, like I must be doing something right.

Indeed, it appeared that there were certain moments that stood out in Small Forward #2's performance recollection that indicated a clutch performance:

Interviewer: Can you recall any games you had in the past, where you've had those kind of performances [clutch performances], and what they were like?

Small Forward #2: Yeah, definitely. I mean, probably even on the weekend, definitely the Grand Final, um, I took a charge from one of their players, in probably like the third quarter, and it really just changed the momentum. Because they were sort of coming at us pretty quickly. And we really needed a stop, and we weren't getting any. So, I got that charge. So, I thought that was a pretty big performance.

Accordingly, Small Forward #2 reflected that this was a clutch performance based on their overall contribution to the game, which included intangible factors (e.g., control), rather than statistical indicators.

Case Report 6 – Guard

Context: The situational context for this case was a must-win game to make the playoffs. As displayed in Table 11, Guard reported feeling more pressure than a normal competitive game. Reflecting on this, Guard noted:

So, coming into this game I wasn't feeling too well throughout the day... especially in front of the home crowd, there's more faces that I knew and whatnot. Yeah, that added pressure of needing to win this game, especially after I played a really good game last week. So, I felt like I needed to, you know, reciprocate that. That's why I'd say I did feel a little bit more pressure, especially because I was worried that I wasn't going to perform at the highest level that I could.

Indeed, Guard reported feeling a general sense of competitive anxiety before games, based on a sense of worry about their performance:

I know, in the back of my mind, that if I'm not playing with confidence, I am going to play bad, no matter, like, how I prepare for the game. So, I guess that adds a bit of anxiety for me, like almost every time I play that's how I feel... I know that my, my floor is pretty low, of how bad I can play, I guess you'd say. But also, my ceiling's quite high. So, I know that, like, if I am feeling good, I'm a really good player. But at the same time, I know that if I don't come to, you know, if I don't come focused and ready to play, I can put a pretty poor performance in.

In summary, Guard reported feeling pressure from a number of situational and internal sources, resulting in a pressure appraisal higher than that of a normal competitive game.

Table 11. Screening Questionnaire

Question	Scale	Response
Overall, how well do you think you performed in this match?	-5 (worse than normal) to 5 (above normal)	-1
To what extent did you achieve your goals in this match?	-5 (did not achieve) to 5 (completely achieved)	3
To what extent were you aware of the incentives to perform optimally in this match?	0 (I was not aware) to 10 (I was completely aware)	8
To what extent were you motivated to perform well in response to these incentives in this match?	0 (I was not motivated) to 10 (I was completely motivated)	8
Overall, to what extent did you feel pressure in this match?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	7
How much pressure would you feel in a typical match in this competition?	0 (no pressure) to 10 (most pressure I have ever felt in sport)	6

Objective Performance. As displayed in Table 12, Guard demonstrated increased performance in field goal attempts. Of note, Guard also played more minutes than their season average. All other performance indicators were maintained.

Table 12. Overall objective performance

Mins/ Game	PTS/min	FGA/ min	FG%	FT%	AST/min
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Season Average (SD)	21.6 (7.27)	.19 (.17)	.28 (.07)	.27 (.26)	.25 (.35)	.16 (.12)
Case Performance	36.15	.30	.39	.35	.50	.08
Z score	2.00	.65	1.57	.31	.71	-.67

As shown in Figure 6, Guard's within-game performance peaked in the third quarter. During this quarter, Guard was performing above their season average in both points ($z = 3.6$) and field goal percentage ($z = 1.5$). Hence the third quarter represented a period of increased performance, in which Guard displayed both *increased effort* and *increased skilled performance*. However, Guard underperformed compared to their season average in both the first and fourth quarter. Specifically, in the first quarter, Guard displayed reduced performance in both points per a minute ($z = -1.12$) and field goal percentage ($z = -1.03$), whilst in the fourth quarter, Guard demonstrated reduced performance in field goal percentage ($z = -1.03$). As such, the overall performance was characterised by periods of underperformance, yet also periods of increased performance.

Figure 6. Chronological Psychological Experience and Objective Performance for Case 6.

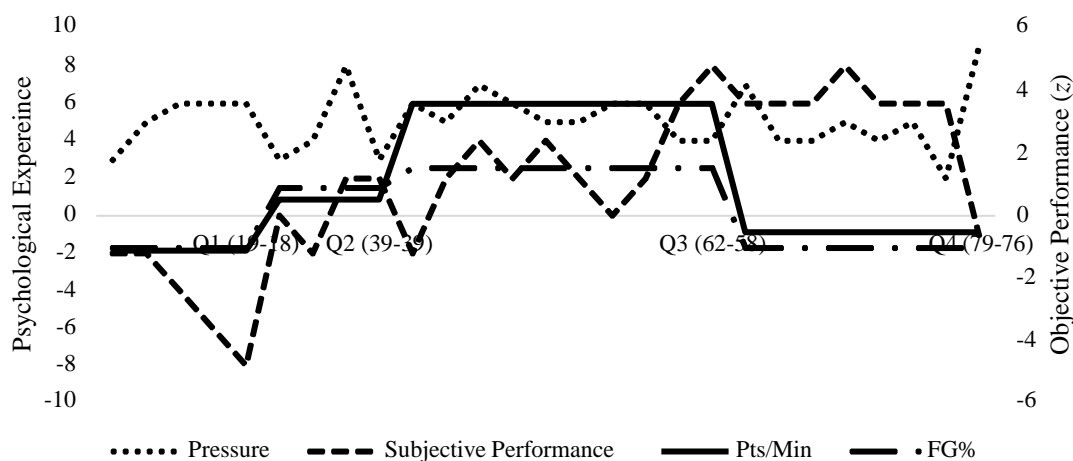


Figure 6. Psychological experience axis is comprised of pressure (0 to 10) and subjective performance (-10 to 10). Objective performance axis is comprised of PTS/min and FG% as scaled z scores. For each quarter, the score of the team to which the case belonged is displayed first, followed by the opposing team.

Subjective Performance. Guard rated their subjective performance as below normal (-1 on a scale between -5 and 5). Reflecting on their performance, Guard reported:

I was just kind of basing it [the response] on how well I know I can play... I think I ended up with five out of 14 for my shooting... I took some bad shots; I didn't make any of my threes. And like I said, I had five turnovers. So, I thought I really didn't have one of my better games. I definitely think I had a pretty average game, if anything, below average.

However, Guard did report that they somewhat achieved their goals for the game (rating goal achievement as 3 on a scale between -5 and 5). Reflecting on this, Guard noted:

The main goal is to win. And I mean, even if I played absolutely terrible, and we had won, there's no one really pointing the finger and saying, you know, like I wasn't worried that anyone was going to blame me... and the fact that I think I ended up scoring like 11 points or something. And for me, I've had games where I've scored none. So, to actually just have an impact in the game and score 11 points. I thought I'd kind of done my job for the day, and I contributed, we got the win. And overall, after the game, I was quite relieved and happy. Even though, it wasn't a five out five, because I, I think I had like five turnovers, and at the end I was like, pretty shocking at the end. You know, at the end of the day, I contributed my 10 points or whatever. I played a lot of the game. So, like, obviously, my coach had the confidence in me to stay in.

As such, Guard reflected that they performed slightly worse than normal, yet partly achieved their goals for the game, and had a sense of contributing towards the teams win.

Within the performance, Guard's subjective performance peaked in the third quarter, especially as the quarter progressed:

That was like peak for the game [finishing the quarter with two lay-ups]... just the fact I was scoring, like I really felt like I was helping the team out... if I didn't have that quarter my goals wouldn't have been met. Especially, with you know, like just the scoring and just, just overall, I definitely think like because of that quarter, after the game, I was able to be satisfied overall with my performance.

Subjectively, there was also a peak early in the fourth quarter, in which Guard made an assist for another player:

That play, the way I dove to the ground, that's like my signature. What I do is kind of like, I'm like diving for it all the time. So that was really good for my confidence... that was probably a turning point where we went on a bit of a run... that was one of my better ones

However, Guard ended the game with a sense of perceived underperformance, driven by both making mistakes on the court, and also a sense of not having the confidence they felt they should:

Instead of actually going for the layup, I tried to pass it and ended up just like throwing a really bad pass off our big guy's feet. So, yeah, I definitely would rate my performance, it drops down pretty low at the end of the game... at the end of the game, I just, every time I get it, I try to give it to [teammate], who is our best player, instead of actually trying to do it myself... like just let him do it, make all the big shots... whereas sometimes [teammate] will say "nah, nah, you take it". Which, I guess, you know, I wouldn't classify myself as a clutch player... I didn't take control at the end, and you know, I didn't take the initiative to actually finish the game out properly.

Was this a Clutch Performance? Guard was slightly conflicted regarding whether this performance classified as a clutch performance:

It'd probably just be, um, hmm, clutch. I wouldn't really say clutch because, yeah, I think towards the end of the game is, where you really define clutchness, and I didn't have that end of game, you know, really impact that I would have wanted. But I guess, I guess, when I was scoring like that, when I went on that like third quarter, like scoring spree, or whatever, that would probably be my, you know, definition of my clutchness, because we, we, did need those points, I guess.

As such, it appears Guard reflected that they had a *clutch moment* yet did not have an overall clutch performance. Indeed, this reflects both Guard's objective and subjective performance during the third quarter, especially as they still appraised increased pressure during this period. Interestingly, Guard also indicated that they felt they were not a clutch performer themselves, but rather relied on confidence to perform well under pressure:

I wouldn't classify myself as a clutch performer at the end of the game. I'd rather someone else hit the shot, you know... I would say that if I had a bad game, and you asked me to hit like, you asked me to play well in the last two minutes. I would really think it would affect my performance, and I wouldn't be clutch, you know. But if I was, if I was hot all game, and I scored 30 points or something, then I really think it would impact my play at the end of the game, because I'm so confident and, it might just be me, but I think basketball is pretty like, it comes down to lot of confidence. And I think that's what being clutch really is defined by, is, like, how confident that player is.

Appendix K: Sampling Rationale

Participant Details and Performance Overview

Sport	Days Later	Standard	Performance Description	
			Objective	Subjective
Basketball	3	Semi-elite	Won important round game	Positive performance
Camogie	3	Semi-elite	Won semi-final	Positive performance
Golf	1	Semi-elite	Won tournament in sudden death playoff	Positive performance
Half Marathon 1	3	Semi-elite	Placed 2 nd overall	Underperformance
Half Marathon 2	5	Competitive-elite	Placed 1 st overall	Positive performance
Rugby Sevens 1	1	Semi-elite	Won tournament	Positive performance
Rugby Sevens 2	2	Recreational	Won tournament	Underperformance
Rugby Sevens 3	2	Semi-elite	Won tournament	Positive performance
Rugby Sevens 4	3	Semi-elite	Won tournament	Positive performance
Rugby League 1	3	Competitive-elite	Won important round game	Positive performance
Rugby League 2	4	Semi-elite	Won trial game	Positive performance
Rugby Union 1	5	Semi-elite	Won round game in last play of the game	Positive performance
Rugby Union 2	6	Semi-elite	Won round game in last play of the game	Positive performance
Rugby Union 3	6	Semi-elite	Won round game in last play of the game	Positive performance
Rugby Union 4	6	Semi-elite	Won round game in last play of the game	Positive performance
Running (5000m)	4	Semi-elite	Placed middle of race	Positive performance
Soccer 1	3	Recreational	Lost final	Positive performance
Soccer 2	4	Recreational	Lost final	Positive performance
Soccer 3	2	Semi-elite	Won final	Positive performance
Soccer 4	4	Semi-elite	Won final	Positive performance
Soccer 5	8	Semi-elite	Won final	Positive performance
Soccer 6	5	Semi-elite	Lost final	Positive performance
Submission Grappling	6	Semi-elite	Won invitational match	Positive performance
Triathlon	5	Recreational	Top 10 finish in age category; personal best	Positive performance