

RESEARCH ARTICLE

Elite College Quarterback Cognitive Functioning: A Qualitative Examination of Cognitive Processing and Mental Skills among Elite College Quarterbacks

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Abstract

The quarterback position is the focal point of our nation's most popular sport, football. Playing quarterback requires an athlete to have advanced knowledge of the game, increased mental capabilities, and a skill set like no other in the sport. Being able to make split-second decisions--when stress and consequences are at their highest--is crucial to a quarterback's success. The multitude of stressors and changing stimuli in a college football game will always be present, but each individual experiences and manages these stressors differently. Every quarterback playing the game of football must operate across multiple levels of attentional foci, they must access and employ different cognitive processes, and they need to utilize mental skills to be successful. In an effort to expand our understanding of the integral quarterback position, in this study we empirically examined an array of elite NCAA Division I quarterbacks' cognitive processes. We qualitatively collected data through semi-structured interviews of elite collegiate quarterbacks across the country, and results highlighted the different cognitive processes, attentional foci, and mental skills that quarterbacks use to be successful. The results of this study can help us better understand the cognitive processes, mental skills, and attentional foci used by elite college quarterbacks to make the necessary decisions to perform effectively in the game of football.

Keywords: Attentional Focus, Cognitive, Sport Psychology, Football Quarterback.

1. A Qualitative Examination of Cognitive Processing and Mental Skills Among College Quarterbacks

Football is considered the most popular sport in the United States, with an annual participation rate of more than one million players at the high school level, as reported by the National Federation of State High School Associations (NFHS, 2021). The contact sport of football is a fast-paced and physical game that requires split-second decision-making that is necessary not only for on-field success, but also for player safety.

At the center of this sport is the quarterback position, a role that requires its participants to process massive amounts of information to repeatedly make quick decisions that are to be executed with tremendous skill and physicality, all while warding off threats to their physical well-being on the field.

The game of football involves an abundance of mental distractions that divert and deter the attentional focus of the athletes involved. Quarterbacks' ability to shift their focus through the different levels of attention is dependent upon those individuals' capabilities to focus on relevant cues even with tremendous

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distractions (Nideffer, 2002). Individuals manage these distractions through different usages of attentional focus, like shifting attentional focus internally to recall past information to then respond accordingly to the outside stimuli (Nideffer, 2002). Additionally, the mental aspect of the game is often neglected when considering additional essential factors that play into on-field success (Kremer, et.al., 2011).

There is a lack of comprehensive studies to date that investigate cognitive processes, attentional foci, and mental skills that impact how elite college quarterbacks make effective decisions on the field. To address this void in the literature, we empirically examined this dynamic by qualitatively examining the experiences of elite college football quarterbacks. Ultimately, we want to better understand how cognitive processes, attentional foci, and mental skills influence Division I college quarterbacks' decision-making.

2. Attentional Focus: What Did You See?

Because of the variability of college offenses, each team differs regarding how much they will run or throw the ball, along with the different reads, progressions, and tasks that a quarterback is required to know. Due to the wide range of variables that need to be assessed, a quarterback must be able to change his attentional focus from a broad view of seeing all 21 other players on the field, to a specific area or individual to attain more information and execute the task. The four levels of attentional focus can be described as “(a) broad-external: quickly evaluating an external situation (e.g., a soccer player quickly looking up the field to observe the offensive alignment of his or her players and of the defense); (b) narrow external: selectively focusing on one or two external cues (e.g., the ball or the goalkeeper); (c) broad internal: analyzing information and developing a strategy (e.g., selecting what type of defensive strategy to use to neutralize the strengths of the opponent); and (d) narrow-internal: focusing on one internal objective (e.g., visualizing a successful shot)” (Ziegler, 1994, p. 545). The distinct levels of attentional focus can be quickly broken within a game that is full of distraction. It is critical to know how an individual can utilize and maximize their focus.

Broad internal focus is the pre-snap thought processes of a quarterback seeing the defense and thinking of the strategy he will have once the ball is snapped (Van Schoyck & Grasha, 1981). But once the ball is snapped, a quarterback's attentional focus will go to finding the information needed to make the correct decision with the football. Fawcett (2015) discusses

how shifting an individual's attentional focus is reliant on the demands of the given situation that the individual is in. For the quarterback position, there will always be constant change and an important part of playing the position is being able to effectively manage your attentional focus in each situation.

Quarterbacks must be efficient in collecting the right amount of information so they can use this information to come to the right decision for the given play (Zsombok, 2014). Because almost every situation is time-limited, quarterbacks must be able to take in a wide range of information through broad external attentional focus, and then be able to quickly switch to narrow external attentional focus. Based on the different demands of the environment, a quarterback's attentional focus will move across the four levels (Ford & Summers, 1992). Managing these attentional foci comes from different cognitive processes and skills that are used to help individuals stay focused. Quarterbacks not only need to utilize their different levels of attention, but also focus on different cognitive processes and mental skills that can impact their decision-making.

3. Between The Ears: Cognitive Processing and Mental Skills

Quarterbacks need to extract relevant information when faced with various stimuli to choose the appropriate plan of action that should be executed for the offense (Bahdur, 2015). The process of coming to a final decision for quarterbacks involves processing different information, utilizing attentional strategies, and being able to pair these two constructs with their working memory capacity (Dudnyk et.al., 2017). Athletes make decisions by shifting their focus internally to recall past information and experiences, and then comparing this information to an immediate external situation (Nideffer, 2003), highlighting the importance of working memory. Working memory is conceptualized as the cognitive mechanisms people use to collect information while taking on an active task (Furley & Memmert, 2012). According to Buszard, “WM capacity is defined as the ability to control attention on task goals in the face of interference (2017, p.54). Individuals fluctuate with their levels of working memory, and individuals have different levels of ability to block out irrelevant information, due to their high levels of working memory (Furley & Memmert, 2012). For a quarterback this involves, among other things, being able to identify false information a defense is giving

because he knows through his memories developed through film study what the defense is showing is not in alignment with the memories, and thus he can make a better decision.

Making good decisions increases one's confidence, and athletes thrive when they are confident because confidence can also negate the impact of distractions to their attentional focus, quickly bringing their focus back to the situation and specific external cue (Nideffer, 2003). In all sports, confidence and how an athlete perceives his skillset has a profound influence on success: individuals that have a high perception of their skills significantly correlates with higher playing performance (Hamre, 2007). Self-efficacy is a mental skill that has been often used interchangeably with the term confidence, and research on self-efficacy and sport performance indicates that higher levels of self-efficacy are related to speed and confidence in decisions made by athletes (Helper, 2016).

Self-talk is another key aspect for an athlete's success and is described as a motivational system that individuals use to improve their performance (Hatzigeorgiadis, 2008). Hatzigeorgiadis (2008) found that an athlete using motivational self-talk will improve their self-efficacy and show better performance because of motivational self-talk. Zetou (2012) found that self-talk improved self-efficacy when an individual was being instructed to use self-talk, suggesting that self-talk would be an effective tool to improve an individual's self-efficacy. Meta-analyses and reviews of literature have shown that positive self-talk enhances motor learning and athletic performance (e.g., Walter, 2019). The different skills needed for a college quarterback to find success are abundant, and that is why coaches and researchers have worked to find a way to incorporate these mental skills into applied settings.

4. Strategies to Improve Quarterback Decision-Making

Research has been conducted on quarterbacks through different interventions and strategies to improve decision making. Past research includes using of virtual reality to see its effect on processing speed, coverage identification, decision-making, and sport anxiety (Kennedy, 2022). Other research done on the cognitive abilities of quarterbacks includes the usage of the occlusion paradigm, wherein researchers looked to improve high school quarterbacks tactical decision-making ability by using novel perceptual training within the temporal occlusion paradigm (Powless &

Steinfeldt, 2020). Other interventions done involve the cope model, which is a brief intervention tool used to aid an athlete in responding effectively to stressful events and acute stressors (Singer & Anshel, 2006).

Athletes must know what stimuli to attend to, while blocking out other specific stimuli to maintain attentional focus. If athletes struggle to do this, then their overall performance will suffer (Nideffer, 1990). The usage of refocusing strategies and focusing on the moment are key for athletes because loss of focus can contribute to poor play (Tedesqui, 2013). Other strategies used to help individuals maintain focus come from verbal instructions. Using specific cue words, phrases, analogies, and metaphors have been shown to elicit external attentional focus (Woo, et.al., 2014). Experience plays a significant role in the success a quarterback has with making each decision by using various levels of attentional focus (Bar-Eli, et.al., 2011). In sum, the best quarterbacks in football are those who show quickness in decision-making, those who utilize narrow and broad focus, and those who can use mental techniques to stay mentally sharp through fatigue.

5. Current Study

In this study, we examined different cognitive processes to better understand how elite college quarterbacks manage their attentional focus to perform effectively. We hope to better understand what impacts a quarterback's focus by examining how different cognitive skills and external factors influenced their decision-making. We also examined the different mental skills and strategies elite college quarterbacks will use to find success on the football field. Because little to no research has examined these dynamics among elite college football quarterbacks, we conducted a qualitative study to explore the experiences of elite NCAA (National Collegiate Athletic Association) Division I college quarterbacks who play at the highest level of FBS (Football Bowl Subdivision) competition.

6. Methods

6.1 Participants

Participants for the current study were eight male Division I college football student athletes from varying college campuses around the United States. Four athletes from the East Coast, two from the South, and two from the Midwest. The mean age for the participants is 21.125 (SD = 1.7). Six of the participants self-identified their race as White, while

the other two participants self-identified as African American and Samoan. All participants in the study self-identified their gender to be male, and their sexual orientation to be heterosexual. Each participant in this study was given a pseudo name. The primary inclusion criteria for participants were that currently being a FBS Division I college quarterback with at least one year of college experience.

6.2 Procedures

Research was conducted in accordance with IRB regulations. The first author contacted prospective participants who were current FBS Division I quarterbacks with at least one year of college football experience, and snowball sampling was done after participants were interviewed to generate word-of-mouth participation opportunities. Each participant was interviewed by first author via Zoom and each interview was recorded and transcribed. Transcriptions were analyzed by the researchers independently, then researchers came together to develop the initial coding scheme, creating Domains and Categories in accordance with CQR methodology (Hill et. al., 1997). Then results were sent to the external auditor to be reviewed, and feedback was incorporated into the final coding scheme. The last step consisted of the first and third author independently running a cross-analysis procedure to find the frequencies of each Category, which completed the CQR methodological process for this study (Hill et. al., 1997).

6.3 Analysis

The CQR process began with research team members reading journal articles on how to conduct CQR (Hill et al., 1997, 2005), along with sample articles that have successfully utilized CQR (Kennedy et al., 2021; Steinfeldt et al., 2011). CQR incorporates multiple qualitative disciplines, including phenomenology, grounded theory, and comprehensive process analysis, along with its philosophical stance grounded in constructivist and postpositivist theories (Hill, et.al., 2005). CQR is considered a suitable methodology for conducting rigorous empirical research (Hill, et.al., 1997).

Prior to analyzing the data, each research member addressed biases they bring to the study that could impact the results of the analysis (Hill, et.al., 2005). The first author of this study is currently a Ph.D. student studying Counseling and Sport and Performance Psychology who played the quarterback position in college. He played the position for over fifteen years competitively, which included being a

starting quarterback for a total of 25 games spanning over three seasons at the NCAA Division I FBS level. With over a decade of experience playing the quarterback position at the highest level, the first author brought considerable knowledge to the study, while also addressing and communicating his potential biases and assumptions during the data analysis process. When considering the specific cognitive processes and mental skills to incorporate into the study, the first author tapped into his personal experiences to conceptualize and shape the study. In addition to a comprehensive literature review and consultations with experts in the field, the first author's personal playing experiences were utilized to create an interview protocol with face validity that would be considered both relevant and enticing to the quarterbacks who were offered opportunities for voluntary participation. Furthermore, as the CQR research team engaged in the process of interpreting the data from the transcripts, the first author was able to help team members understand different verbiage and concepts each quarterback used to convey their experience.

The second author is the Principal Investigator and external auditor of this study, but also is the creator and director of the Sport and Performance Psychology minor at Indiana University, while also being a former professional and collegiate athlete in football, baseball, and basketball. The third author is a former high school basketball player and current Ph.D. student studying Counseling and Sport and Performance Psychology. The fourth author is also a Ph.D. student studying Counseling and Sport and Performance Psychology, while also being a former collegiate soccer player. The fifth author graduated with a degree in engineering and played football in college. To summarize, the results of this study were analyzed by former athletes coming from multiple sports with different biases, assumptions, and views from their given sport. It is important that the researchers stayed cognizant of their biases throughout the data collection process to successfully run CQR (Hill, et.al., 2005).

After in-depth literature review and in consultation with experts with years of professional experience in the field of Sport and Performance Psychology, our interview protocol was developed (Appendix 1). Each member of the research team read through each transcript to start independently generating themes from the data. This process involves independently coding the transcripts to begin clustering similar information and then bringing their themes to the group meeting (Hill,

et.al., 2005). The research team met to discuss their individually-derived themes, to create agreement amongst the team regarding the preliminary structure that was comprised of Domains of Categories, with illustrative Core Ideas that clarified the meaning of each Category within each Domain. This preliminary categorization structure was then sent to the external auditor to review and provide feedback. The final step on the data analysis process included a cross-analysis of the data by the first and third author to strengthen the findings of the CQR process. In this final step the frequency of each Category was established, and then one final meeting with the group was held to create the final categorization structure (Hill, et.al., 2005).

Appendix 1

Interview Protocol

1. Walk me through a week of game prep, what does your weekly routine of prep look like-What strategies have helped you find the most success
2. How does film study impact your confidence for an upcoming game-What are you looking for when you are doing film study
3. What makes you feel ready to play a game...What support helps your prepare for a game?
4. When you're replaying a game, how do you incorporate memories from film study (we will call that long term memory here) into your decision-making process?
5. Throughout a game, how do you use short term memory (we will define short term memory as using what just happened in the previous play or drive) to impact your decision making- And how does it affect you in the game, start to get rattled
6. What events during the game can impact your decision-making process? What can speed it up/ slow it down
7. What do you do to stop yourself from acting on negative impulses throughout the game? (For example, you really want to throw a deep ball to the field, but it's 3rd down, so what do you do to XX)
8. Walk me through a basic drop back pass, where are your eyes and how does your focus change throughout the play
9. 3rd and 8 game is on the line, drop back pass is called, walk me through your levels of focus
10. Do you ever find yourself stuck in one area of focus (For example, locked in to one receiver = narrow or for example, scanning the field but nothing specific= broad?)

11. What does the term "Mentally Tough" mean to you as a quarterback- How do you maintain it

12. What does the term "Self Talk" mean to you - tell me the difference between positive self talk and negative self-talk {if they don't know, differentiate it for them... + = you got this or I'm gonna make this throw etc - = you are gonna screw this up again or don't miss this throw)

13. How often do you use this positive self-talk and what does that positive self-talk do for you?

7. Results

The analysis of the interview transcripts conducted by the research team generated numerous individual themes within the data. Once the consensus building process was complete in accordance with CQR protocol, four Domains and 17 Categories were generated by the research team. The four established Domains from the data include: (a) *Impact of Preparation*, (b) *Mechanism for Self-Regulation*, (c) *Volatility of Confidence*, and (d) *Maintaining Attentional Focus*. The cross analysis was then completed to confirm the Categories created from the data, along with assessing the frequency (i.e., general, typical, variant) of each Category within the data (Table 3).

7.1 Domain 1: Impact of Preparation

Our first domain focused on the quarterback's game week preparation, and the different aspects of what their week of preparation looks like prior to competition. Domain one contained five categories: (a) *Grounding in Training*, (b) *Training Builds Self-Efficacy*, (c) *Team's Game Week Preparation*, (d) *Macro vs Micro Aspects of Film Study*, and (e) *Long-Term Memory*. The first category, *Grounding in Training*, was found in five of the eight transcripts, resulting in a typical response. Participants discussed how consistent film study and doing what you have been taught by your coaches can bring you success during the game. Dustin stated:

Stay true to your training and if you're trying to go out and start doing sh!t on your own just because you had a little bit of success then that's usually not going to work out because the only reason you had that little bit of success at first is because you're staying true to your training.

The next two categories, *Training Builds Self-Efficacy* and *Team's Game Week Preparation*, each produced a general response from all eight participants. Participants expressed how practicing against the

specific looks they expect to see in the game can give them confidence to perform once it is time to compete, as well as an in-depth description of what each day of their week will look like leading up to the game. Larry stated:

Coaches giving me the looks that the Defense that we're playing, they give us the looks at the end I think that's the biggest, the biggest thing like when you practice something throughout the whole week against a certain look and you come in the game and they give that exact look, you know I mean it's like answers to the test.

The final two categories, *Macro vs Micro Aspects of Film Study* and *Long-Term Memory*, also produced a general response from all eight participants. Participants discussed how they look at film throughout the week, and keys they took away from film study during the week to anticipate defensive looks and prepare them for competition. Chris stated:

Everything I studied from a film perspective is situational based so like if it's a two-minute call I know what they're gonna run I'm anticipating what they're going to give me a two-minute if it's a third and long, I'm anticipating that.

Table 1. Domains and Categories

Domains/categories	Illustrative core idea	Frequency
Domain 1: Impact of Preparation		
Grounding in training:	Stay true to your training and trust what you've been taught	Typical
Training builds Self-Efficacy:	A good week of practice is a confidence booster	General
Team's Game Week Preparation	Film study is comparable to studying for a test although you don't have the answers but you feel prepared	General
Macro vs Micro Aspects of film study	General idea of what the defense will present	General
Long Term Memory:	Use what you saw on film in the game	General
Domain 2: Mechanism for Self-Regulation		
Self-Talk	How I communicate with myself both positively and negatively	General
Breathing:	Focusing on my breath calms me down	Typical
Support from Coaches and Teammates:	Coaches and teammates give me reassurance	Typical
Managing external Factors:	Not letting outside sources distract you.	Typical
Domain 3: Volatility of Confidence		
Faux-Amnesia:	Got to forget when things are going bad	Typical
Discrepancy:	Schemes we didn't see on film creates hesitation	Typical
Interception:	Threw a pick and got down on myself	Typical
Perfectionism:	I'm a perfectionist so I get frustrated with myself	Typical
Domain 4: Maintaining Attentional Focus		
Narrowing focus to an individual:	Eyes are on the safety	General
Defensive Concepts:	I'll just look at the big picture	General
Short Term Memory:	Not going to remember everything I saw on film	Typical
Quarterback Progression:	We know our rules and progress to the next guy	General

Note. General = all 10 cases; Typical = more than half of cases; Variant = half of cases or less.

Table 2. Participant's Demographic Information

Pseudonym	Age	Race	Sexual Orientation
Larry	22	Samoan	Straight
Steven	19	Caucasian	Straight
Jack	20	Caucasian	Straight
Dustin	19	Caucasian	Straight
Richard	23	Caucasian	Straight
Chris	21	Caucasian	Straight
Jim	24	Black	Straight
Evan	21	Caucasian	Straight

7.2 Domain 2: Mechanism for Self-Regulation

The second domain, mechanism for self-regulation, focused on interventions, skills, will utilize themselves throughout the week and during competition. This domain had four categories: (a) *Self-Talk*, (b) *Breathing*, (c) *Support from Coaches and Teammates*, (d) *Managing External Factors*. The first category within this domain, *Self-Talk*, produced a general response from each participant. Participants interpreted *Self-Talk* as how they talk to themselves during practice and games, along with focusing on the positive and negative impacts of *Self-Talk*. Category two, *Breathing*, was noted in four of the transcripts, producing a typical response for this category. Participants reported this category as being the different techniques and breathing strategies they will use to help calm themselves and to also regulate their emotions. Richard stated: “That’s definitely something that I use, like breathing techniques or you know, just whatever distraction - distractive thoughts to try to get away from that negative mindset”.

Category three, *Support from Coaches and Teammates* produced a typical response where five of the interviewees endorsed this category. Interviewees illustrated this category as the emotional support they receive from teammates and coaches during practice and in games. Jim stated:

They love to crack jokes on the sideline because they say when I’m loose and I’m having fun and smiling I play I play great so um you know hats off to the the guys around me in the quarterback room for keeping it keeping my head and will keeled.

Category four, *Managing External Factors*, resulted in seven of the participants discussing this category, producing a typical response. Participants outlined this category as the different mindsets, techniques, and strategies they use to manage external factors such as in game stressors and unforeseen circumstances within a game. Chris specifically stated:

Something that I’ve been playing with myself is having a neutral mindset and having a neutral mindset is really kind of what I was talking about with mental toughness and how I’m just taking emotion out of what’s going on around you is just so important.

7.3 Domain 3: Volatility of Confidence

Our third domain, *Volatility of Confidence*, consisted of the different aspects of the game that can hurt a

quarterback’s confidence, but also focused on what quarterbacks can do to maintain their confidence during practice or games. Domain three consisted of four categories: (a) *Faux-Amnesia*, (b) *Discrepancy*, (c) *Interception*, (d) *Perfectionism*. The first category within this domain, *Faux-Amnesia*, was noted in six of the transcripts, producing a typical response. *Faux-Amnesia* interviewees outlined as being a common tactic for forgetting a past negative play and moving on to the next play with a clear mind. Jack stated:

If you throw a pick, yeah it sucks, so you just have to not care, because if you didn’t care about it, there’s no changing putting yourself in a position to win the game, so you just kind of have to be like you have no f*cks about like what has happened in the past.

Category two, *Discrepancy*, emerged in seven of the transcripts, generating a typical response. *Discrepancies* portrayed by the interviewees were focused on in game situations where the quarterbacks would see a defensive scheme that they had not seen or practiced during their week of preparation. According to Jack:

We always have a great plan going in, but we’re such a unique offense teams will just do the most random stuff versus us and that is what we see on tape. It’s very few times to we see exactly what we think we’re going to get.

Category three, *Interceptions*, was discussed in six of the interviews, producing a typical response. Interviewees focused on detailed interceptions by expressing the impact throwing an interception in a game or during practice can have to a quarterback’s confidence. Jim stated:

We had a practice where I threw a pick six, I’m like woah, to see like what’s going on here I’m sitting there everybody pat me on my head like it it’s okay Jim it’s okay Jim I’m like that was so terrible but you know just trying to boost myself and motivate myself.

The last category of this domain, *Perfectionism*, appeared in four of the transcripts, producing a typical response. *Perfectionism* was described by the interviewees as the negative consequences a singular mistake can have on the quarterback’s confidence during a game or in practice. Larry stated, “Being a competitor and I would like playing with a lot

of passion and stuff that I feel like, when I make a mistake it's kind of hard for me to move on from it".

7.4 Domain 4: Maintaining Attentional Focus

Domain four, *Maintaining Attentional Focus*, highlighted the usage of attentional focus and short-term memory's impact on the interviewees decision making processes. Domain four consisted of four categories: (a) *Narrowing Focus to an Individual*, (b) *Defensive Concepts*, (c) *Short-Term Memory*, (d) *Quarterback Progression*. Category one, *Narrowing Focus to an Individual*, was reported in all eight transcripts, resulting in a general response. Narrowing foci to an individual demonstrated the quarterback's visual awareness of seeing the defense, and participants portrayed this as seeing the defenses in a narrow lens by focusing their attention on a single individual. Steven mentioned: "I think there are times where I kind of lose the integrity of finding my reads but I dropped back and I just don't really put my eyes anywhere I'm looking at the defensive as a whole."

Category two, *Defensive Concepts*, was noted by participants in each interview generating a general response. Defensive concepts reflected how quarterbacks analyze the entire defense by focusing their attention broadly to see the whole field to help themselves make a decision. Dustin mentioned:

Different looks that we're going to get from the defense and I'll know when we're going to need to like check out of a call or like check into a call, like the safeties' rotation or check like linebackers moving over to like key that there's going to be a blitz.

Category three, *Short Term Memory*, was noted by five of the participants producing a typical response. *Short Term Memory* was defined as quarterbacks taking information from a previous play or in the same drive to help themselves with future decision making during the game. Evan stated:

The first drives, being the feeling-out process and then you go through that feeling-out process, that's when you need to use the previous play, previous drive. A lot of the time when you have less long-term memory to draw back on.

Category four, *quarterback progression*, was mentioned by all eight participants generating a general response. *Quarterback progression* was outlined by participants on how they will analyze and run a routine drop back pass, while discussing what it

is they are looking for during the play and how they make their decisions with the football. Steven stated:

Get my eyes onto the flat defender whether it's the corner or if it's a linebacker buzzing out and reading his hips his with his in his depth and you know if. If he playing real deep then I'm going to go into that bubble flat right away. If it's three and that the corners kind of bailing out with the bow route and he's been in the five, that's when all kind of work back to my progression to the over and then to the dig.

8. Discussion

Our data analysis provided a better understanding of college quarterbacks cognitive functioning, attentional foci, preparation, and self-regulation. One domain (*Maintaining Attentional Focus*) addressed quarterbacks' different levels of attentional focus and how they use these levels of focus during competition. Two domains (*Volatility of Confidence*, *Mechanism for Self-Regulation*) focused on how quarterbacks manage the different stressors that impact them during competition, while also focusing on what factors negatively affect their confidence. The last domain (*Impact of Preparation*) investigated different practices and strategies quarterbacks and teams use to prepare for a game. The four domains and 17 categories aligned with research focused on cognitive functioning, self-regulation, attentional focus, and confidence (Nideffer, 2003; Buszard, 2017; Hamre, 2007; Hatzigeorgiadis, 2008).

Results also showed the connections between domains and the different cognitive processes and mental skills elite college quarterbacks use. *Impact of Preparation* resulted in athletes discussing how training and a good week of practice impact confidence. *Mechanisms for Self-Regulation* pointed out how quarterbacks can manage stressors. *Volatility of Confidence* highlighted negative impacts of perfectionist viewpoints. These results were consistent with past research conducted on the impact of confidence, self-regulation, and preparation, along with findings showing that high confidence is connected to positive affect, effective competition behaviors, and effective competition (Hill et. al., 2009). Our data also indicated that quarterbacks who are confident in their ability to perform are better at managing external factors of the game, which is also consistent with the findings of Hill and colleagues (2009) who found that high confidence increases an athlete's ability to cope while under pressure.

Maintaining Attentional Focus highlighted the different levels of focus quarterbacks will have when they are reading defenses, going through progressions, and making decisions on the field. As defined earlier, narrow external focus is when an individual focuses their attention on one singular external factor, which our results demonstrated to be an essential task for quarterbacks to do. Like past research, having the ability to focus externally on a single object can enhance an athlete's performance (Grgic & Mikulic, 2021). Athletes in this study emphasized the importance of singular individuals that will give them the answers on where to throw the football as well as what decisions to make as the play unfolds. On the other hand, quarterbacks in this study reported that it can be detrimental to their play when they can't narrow their focus and are too focused on seeing the big picture.

Mechanism for Self-Regulation represented different strategies quarterbacks use during practice, games, and during the week to manage different stressors of playing the quarterback position. Participants highlighted being able to stay mentally tough and have positive self-talk as ways to achieve success. These quarterbacks' responses aligned with research on coping—that is, how athletes with exceptional coping mechanisms and self-regulatory practices can translate these tools to enhanced performance (e.g., Gorskaya, 2019): coping mechanisms and self-regulation skills are essential for quarterbacks stay calm and perform under pressure.

Nideffer (2002) points out that successful athletes require the ability to maintain focus while participating in their given sport. Nideffer (2002) highlights four important factors that play into an athlete performing under pressure: biogenic differences, individuals' awareness, automated performances, and level of confidence. The results of our study presented four domains that directly align with Nideffer's theory regarding what can lead to an athlete performing under pressure, including the impact of preparation, mechanisms for self-regulation, volatility of confidence, and maintaining attentional focus. *Impact of Preparation* links with automated performances which is described by Nideffer (2002) as practicing a skill until it is automatic for the individual. *Mechanisms for Self-Regulation* also being like Nideffer's (2002) description of an individual's awareness regarding maintaining individual focus and managing distractions. *Volatility of Confidence* being like Nideffer's (2002) description of level of

confidence an athlete has in their ability to perform; while our study found from each quarterback that confidence is the most important factor to their success. Although our study did not focus on biogenic differences amongst individuals, we are pleased to see similarities of Nideffer's (2002) work on individuals' attention potentially connected to the findings of this study.

9. Conclusion and Implications for Practice

These findings can be used to assist college quarterbacks in preparing for competition and give coaches a guide for what can make their quarterbacks feel confident and prepared to compete. *Impact of Preparation* highlighted the importance of practice and how the week of preparation leading to a game can build confidence for the quarterback. Confidence was highlighted by each quarterback as being one of the most important factors to playing well. *Impact of Preparation* also emphasizes tactics quarterbacks use while watching film to help them prepare for competition. *Mechanisms for Self-Regulation*, and *Volatility of Confidence* focused on what can erode and impact a quarterback's confidence, in addition to how they can then maintain their confidence through adversity.

Maintaining Attentional Focus helped give a better idea of what quarterbacks look at before and during a play. Quarterbacks highlighted how short-term memory can prove to be beneficial to adjusting to new defensive concepts and to discrepancies they see from film study to the game. *Maintaining Attentional Focus* also noted the different levels of focus quarterbacks will have throughout a play. Pre-snap, quarterbacks highlighted seeing the bigger picture with a broader focus so they can get an understanding of the defense concept. During the play, quarterbacks highlighted the importance of narrowing their focus to an individual or area of the field. Knowing this information can be beneficial for coaches to teach quarterbacks how they can read a defense along with highlighting what quarterbacks should focus on once the play begins.

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