ABSTRACT

COLLEGE ATHLETES’ APPROACHES TO INDIVIDUAL PRACTICE

by William R. Low

According to the theory of deliberate practice (Ericsson, Krampe, & Tesch-Römer, 1993), level of performance in a domain is directly related to the amount of accumulated deliberate practice. However, performance depends on quality of practice as well. Research in sport has investigated the quality and characteristics of organized team practices, but few studies have explored how athletes practice on their own. The purpose of this study was to examine how team-sport athletes experienced and approached individual practice. One-on-one semi-structured interviews were conducted with nine NCAA Division I athletes in basketball, ice hockey, field hockey, and soccer. Key findings were the perceived importance of individual practice to performance, the potential for enhancing the quality of practice, and the benefits of individual practice beyond skill acquisition. Implications and directions for future research are also discussed.
COLLEGE ATHLETES’ APPROACHES TO INDIVIDUAL PRACTICE

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Basketball Hall-of-Famer Bill Bradley has spent much of his life in the public spotlight as a star for Princeton and the New York Knicks, and as a U.S. senator, but he has also spent hours alone in an empty gym. In high school, Bradley borrowed keys to his school’s gym so he could follow a schedule of individual practices he set for himself. He practiced year round every day of the week, usually for three hours but as many as eight on Saturdays (McPhee, 1999). The amount of time he spent practicing alone is striking, but he also was innovative in the way that he practiced. When he dribbled around chairs that served as opponents, he put lead in his sneakers for added resistance and wore eyeglasses with cardboard taped over them to avoid the habit of looking down at the ball (McPhee, 1999). Bradley became known for his performances in front of crowds, but he spent far more time in preparation for competition than in competition itself.

Similarly, former UCLA basketball coach John Wooden called himself “more of a practice coach than a game coach” because he believed players would perform well if they practiced well (Wooden & Tobin, 2004, p.113). He would spend as many as two hours planning a single practice, took careful notes during it, and kept detailed records of what the team did at every practice. The way he conducted practice reflected a desire to maximize the number of repetitions for each player. For example, he believed in correcting a player individually instead of stopping group action unnecessarily. Wooden said, “I wanted my players to feel that the worst punishment I could give them was to deny them the privilege of practicing. If they did not want to practice, I did not want them there” (Wooden & Tobin, 2004, p. 108).

Early Research on Practice

The success of both Bradley and Wooden in competition indicates the important role practice plays in quality performance, and research has expanded on such anecdotal evidence to further understand the phenomenon of practice. An early example is De Groot’s (1965) study that compared the abilities of chess grandmasters and intermediate players to recall the positions of chess pieces on a board. When boards with games in progress were shown to subjects, grandmasters could replicate the positions of the pieces almost perfectly while the intermediate players could not. However, after the grandmasters looked at a board of randomly placed pieces, they could not replicate the positions any better than the intermediate players. These results suggested grandmasters had learned to see a chess game differently through experience, and that this experience, rather than better general memory, developed their ability to replicate the
positions of pieces in a game. After replicating De Groot’s (1965) results and reviewing the careers of grandmasters, Simon and Chase (1973) concluded that players take at least a decade of dedication to the game, including 10,000 hours of practice, before reaching the level of grandmaster.

Research has also supported the role of practice in motor skill acquisition. Fitts and Posner’s (1967) theory of human performance argued that motor skills become increasingly autonomous from cognitive control as a learner practices more. Schmidt (1975) theorized that skill acquisition is guided by a schema that is refined by further experience executing a given skill. Building on this early literature, Ericsson, Krampe, & Tesch-Römer (1993) proposed the theory of deliberate practice, which has guided research on expertise in sport. The following review of this research starts by outlining the theory of deliberate practice and its application to sport. The next two sections discuss how innate qualities, play, and diversification contribute to expertise development, followed by a review of concrete approaches to designing practice effectively. Given this research on how athletes should practice, the next section examines what they actually do in practice. Finally, the rationale and research questions for the current study are provided.

**The Theory of Deliberate Practice**

The theory of deliberate practice explains how performers develop expertise. It states that level of performance is monotonically related to the amount of accumulated deliberate practice (Ericsson et al., 1993). That is, the more deliberate practice one accumulates, the higher level of performance he or she will reach. This relationship implies that to achieve expertise, individuals should be exposed to a domain as early as possible to maximize their amount of deliberate practice. Each year, they accumulate more deliberate practice than they did the year before, and consistent with Simon and Chase (1973), Ericsson et al. (1993) advocate a “10-year rule” that states expertise requires at least 10 years of regularly engaging in deliberate practice. Since performers can accumulate different amounts of deliberate practice in 10 years, this rule does not mean a performer will necessarily become an expert after engaging in deliberate practice for 10 years. Instead, 10 years seems to be the minimum period of time required to become an expert.

Ericsson et al. (1993) supported this theory with their study of violinists at a music academy. The violinists were divided into three groups according to performance level: best violinists, good violinists, and music teachers, who were expected to become teachers rather than
orchestra performers. First, the researchers operationalized deliberate practice as “practice alone” because the violinists rated it as the activity most relevant to performance, and the violinists then estimated their weekly amount of violin practice each year since they started playing the instrument. Members in all three groups had engaged in deliberate practice for at least 10 years. By age 18, however, the best violinists had accumulated 7,410 hours of deliberate practice—significantly more than the good violinists (5,400 hours) and music teachers (3,000 hours) had accumulated. Thus, expertise had a strong positive correlation with deliberate practice.

An activity must meet certain conditions to be deliberate practice. First, it is designed specifically to improve one’s abilities. Performers must identify skills that need improvement and choose a task in their “learning zone,” where the skills to complete that task are just out of reach of current abilities. The “learning zone” is in contrast to the “comfort zone,” which consists of skills already well-learned, and the “panic zone,” whose demands are too great to meet before first making progress in the “learning zone” (Colvin, 2008, p. 68). The opportunity to practice weaknesses distinguishes practice from competition. Making mistakes is too costly in competition because athletes are expected to perform their best, so they utilize strengths rather than try undeveloped skills (Ericsson et al., 1993). In practice, athletes can try those undeveloped skills since mistakes have little consequence.

The second condition of deliberate practice is that the task is repeated many times while performance is closely monitored. Coaches and teachers are often necessary to monitor the performer and provide feedback; however, performers can gradually learn to evaluate themselves (Ericsson, 2006). The third condition is that deliberate practice is physically and mentally exhausting. Repeating a difficult task to achieve a specific goal and monitoring progress are more taxing than casually performing an easy task. This characteristic distinguishes deliberate practice from play, such as backyard soccer or leisurely shooting baskets, which are less structured and done purely for enjoyment. It also means performers can engage in only a limited amount of deliberate practice each day. Although more practice is correlated with better performance, the daily limit downplays the need for endless hours of practice and reinforces the importance of quality training. Finally, strictly following these conditions makes deliberate practice not inherently enjoyable, so the potential for improvement is what motivates performers to practice (Ericsson et al., 1993).
In summary, performance is directly related to the amount of deliberate practice a performer accumulates, and Ericsson et al. (1993) contend that as many as 10 years of regular and intense deliberate practice are required to become an expert in a given domain. Yet deliberate practice is not just any activity related to the domain, for the content of practice must meet the specific conditions that are focused on improvement.

**Deliberate Practice in Sport**

Although Ericsson et al. (1993) developed the theory of deliberate practice from studying musicians, they suggested its applicability to other domains, including sport. This section reviews the research that has tested the definition of deliberate practice and its relationship to performance in sport.

Support for the monotonic relationship between performance and practice has been found in several individual sports. Following the procedures of Ericsson et al. (1993), researchers asked athletes to recall practice histories and rate activities on relevance to performance. International-level wrestlers and figure skaters reported accumulating 12 and 16 years of deliberate practice, respectively (Starkes, Deakin, Allard, Hodges, & Hayes, 1996), and these amounts are comparable to those of Ericsson et al.’s (1993) musicians. Law, Côté, and Ericsson (2007) also found support for the monotonic relationship in rhythmic gymnastics.

In addition, there is evidence that the theory of deliberate practice applies to team sports. International-level soccer players reported significantly more practice than national and provincial-level players, and this gap increased as their careers progressed (Helsen, Starkes, & Hodges, 1998). Similarly, the largest gap between accumulated practice of international, national, and provincial-level field hockey players was at the latest point of their careers, so experts tended to increase their amount of practice even after distinguishing themselves as advanced performers. In another study, Weissensteiner, Abernethy, Farrow, and Müller (2007) studied three age groups of male cricket players and divided each group into skilled and less-skilled players. The skilled players in each group had accumulated significantly more practice than the less-skilled ones.

While the practice histories of expert athletes resembled those of expert musicians, sport psychology research has recognized the differences between sport and music practice and has attempted to operationalize deliberate practice for sport. Practice alone was clearly the one activity most relevant to performance for Ericsson et al.’s (1993) musicians, but practice alone is
too vague to describe deliberate practice in sport because it could include various activities. For example, ice skaters included weight training, lessons on jumps, and program run-throughs as practice that they can do alone, but only lessons and program run-throughs are relevant enough to performance to constitute deliberate practice. Practice with others and as a team can also be deliberate practice (Helsen et al., 1998; Hodge & Deakin, 1998; Starkes et al., 1996). Helsen et al. (1998) suggested individual and team practice are deliberate practice since amount of individual practice distinguished between skill-levels early in soccer players’ careers while amount of team practice distinguished international-level players from others after 12 years into careers.

Still, a single definition of deliberate practice in sport remains unwarranted because deliberate practice is sport-specific. Ice skaters (Starkes et al., 1996) reported working alone with a coach as the one most relevant form of practice, but karate students (Hodge & Deakin, 1998) rated group lessons as most relevant for them. This difference is likely due to the nature of each sport. In ice-skating, working one-on-one seems logical because each ice-skater has his or her own unique program, whereas karate students all learn the same kata, or standardized choreography of moves. Because what constitutes deliberate practice is sport-specific, deciphering a formula that applies to all sports is less important than realizing that certain practice formats in each sport are more relevant to performance than other formats.

Examining practice microstructure, or the activities done within those practice formats, clarifies what constitutes deliberate practice. Wrestlers rated both practicing alone with a coach and mat work with others as the two activities most relevant to performance (Starkes et al., 1996). Soccer players rated working alone with a coach as the most relevant activity within individual practice, while the games, tactics and technical skills were the most relevant team-practice activities (Helsen et al., 1998). In addition, karate students rated sparring and kata training as highly relevant (Hodge & Deakin, 1998). The common denominator among these activities is that they replicate what is actually done in performance. This is not to say that activities such as weight training or watching game film do not contribute to performance. In fact, they are often necessary for both non-expert and expert athletes in similar amounts, but what separates experts from non-experts is experts’ extensive time in the activities that replicate performance (Starkes et al., 1996).
These nomothetic studies (Helsen et al., 1998; Hodge & Deakin, 1998; Starkes et al., 1996) have allowed researchers to generalize the theory of deliberate practice to sport; however, idiographic research has illuminated the detailed process of engaging in deliberate practice, or *how* athletes practice. Orlick and Partington (1988) interviewed Olympic medalists, and deliberate practice was evident in the training habits of these elite athletes. For example, the Olympians reported approaching practice with the same intensity and mental preparation as they do for competition. They also set clear goals for each workout or even for particular parts of a workout, including writing down goals or charting performance in detail throughout practice so they were aware of what they could improve. This habit reflects the close monitoring and focus on improvement that are essential to deliberate practice.

The Olympians also emphasized quality of training over quantity. For instance, skiers only do a few runs per practice session, so one skier stressed that she must make the most of each run (Orlick & Partington, 1988). In a separate study, Olympic swimmers decreased mean annual hours of deliberate practice after age 17 and attributed this decrease to more emphasis on quality training (Johnson, Tenenbaum, & Edmonds, 2006). Overtraining can also result in staleness, in which performance significantly declines for an extended period of time, or burnout, when an athlete is physically, psychologically and emotionally exhausted from participating in a sport (Weinberg & Gould, 2010). In short, the content of deliberate practice includes not only the specific skill or technique that is practiced, but also how athletes ensure they practice it effectively.

Singer and Janelle (1999) pointed out that the research on practice cannot conclude practice *causes* expertise. Most studies have relied on retrospective data and only identified correlations between practice and performance level, so perhaps more naturally talented athletes simply practiced more. However, Helsen and Starkes (1999) conducted a controlled experiment that investigated the practice-performance relationship when they tested the general motor and soccer-specific skills of expert and intermediate soccer players. If the experts derived their expertise from natural talent, they would be expected to outperform the intermediate players in soccer-specific *and* general motor tasks, but the experts only performed better in the soccer-specific tasks. These results implied that expert abilities were in fact a product of practice, not talent.
Talent and Innate Qualities

While the theory of deliberate practice and subsequent research asserts practice is the main determinant of performance, innate talent may still exist and contribute to performance. Howe, Davidson, and Sloboda (1998) defined talent as having five properties: 1) it is genetic, and therefore innate, 2) its full extent may not be evident in early stages of development, but there will be indications of it, 3) early indications predict who will excel, 4) only a minority has talent, and 5) talent is domain-specific.

The theory of deliberate practice contradicts the second and third parts of this definition, but some evidence supports the role of talent. Johnson et al. (2006) examined the practice histories of elite and sub-elite swimmers. The groups spent similar amounts of time in deliberate practice, yet a difference in performance level still surfaced. Therefore, deliberate practice is probably necessary, but not sufficient, to attain expertise (Johnson et al., 2006). Differences between elite swimmers further indicated the role of talent. One Olympic gold medalist started swimming at age 6 and had accumulated over 12,000 hours of deliberate practice by age 20, but a fellow gold medalist did not start swimming until age 17 and had only accumulated about 4,000 hours of deliberate practice by age 20 (Johnson et al., 2006). The idiosyncratic nature of these swimmers’ development contradicts the 10-year rule and supports no universal formula of deliberate practice.

In addition to innate qualities such as size or athleticism, relative age can be an advantage for some athletes and a disadvantage for others. The relative age effect (RAE) is the phenomenon that the oldest youth athletes on a team or within a league’s age group tend to have a better chance of becoming elite athletes than their peers who are several months younger do. It explains why a disproportionally large number of elite athletes in several sports are born early in the year. In Canada, youth hockey is grouped by calendar year, and many of the best players have January or February birthdates (Addona & Yates, 2010). When they are young, these players are likely to be more physically mature than those who have birthdates at the end of the year but are still classified in the same age group. Physical maturity often means greater size, strength, and coordination, all of which typically lead to superior performance. This superior performance catches the attention of top youth coaches and teams that give these players the opportunity to play for them, so these players receive the best training and playing experience, eventually leading to the professional level. The RAE has also been documented in soccer (Del Campo,

Despite the role of talent and innate qualities, deliberate practice research remains especially relevant to athletes. Knowing that innate talent and birthdates may play a role in expertise development lacks utility for athletes, other than potentially boosting or deflating confidence. If athletes do know they lack talent, that knowledge does not change what they can do in the present to reach an elite level since they cannot, by definition, alter their levels of innate talent. A youth sport organization could minimize the RAE by adjusting cutoff dates or its grouping of athletes, but it is impractical for an individual athlete to enact such change and avoid the RAE. Thus, while talent or innate qualities may be of interest to scouts or coaches, the proposed study is geared toward understanding practice, or what athletes can do to improve.

**Play and Diversification**

Recent research has questioned whether deliberate practice in one’s sport is the only activity athletes can do to develop expertise. To accumulate maximum deliberate practice, Ericsson et al. (1993) argued that performers need to specialize in their domain early in their careers. Specialization is training for and competing in a single sport year-round in a high-level program, which is distinct from participating in only one sport in addition to other non-sport activities (Wiersma, 2000). In other words, youth athletes concentrate their time on one sport, and that time is spent in deliberate practice.

Two alternatives to domain-specific deliberate practice are diversification and deliberate play. Diversification is participating in various sports and activities “through which an athlete develops multilateral physical, social, and psychological skills” (Wiersma, 2000, p. 13). Playing other sports likely generates skills that transfer from one sport to another (Côté, Baker and Abernethy, 2003). For instance, perceptual abilities in soccer could transfer to field hockey since both sports require a player to read and react to opponents’ actions, and biomechanical skills of throwing a pass in football could transfer to pitching in baseball. While athletes could acquire the same skills by specializing in one sport, they may be more likely to burn out of the sport before they reach peak performance (Wiersma, 2000).

Deliberate play (Côté et al., 2003) is playing games of a sport, such as pick-up basketball. It is different from free play of infants and young children because participants follow the rules of a sport, but deliberate play’s goals, sources of enjoyment, and lack of structure during the
game distinguish it from deliberate practice. Athletes engage in deliberate practice explicitly to improve, so they carefully monitor their execution of skills, are focused on resulting improvement (i.e., the outcome), and derive enjoyment from achieving this resulting improvement, not from the process itself. In contrast, the process of deliberate play is inherently enjoyable. Participants focus on playing the game and only loosely monitor it since they are more interested in fun than improvement (Côté et al., 2003).

From studying the development of elite junior athletes in rowing and tennis, Côté (1999) proposed the Developmental Model of Sport Participation (DMSP) that suggests diversification and deliberate play both contribute to expertise. The DMSP divides development into three stages. In the sampling years (age 6-12), athletes participate in several sports, mostly in the form of deliberate play. Because deliberate play is enjoyable, it maintains motivation to continue sport participation. During the specializing years (age 13-15), athletes focus on one sport, spending equal time in deliberate play and deliberate practice. Finally, the investment years (age 16+) include sport specialization and focus on deliberate practice (Côté & Fraser-Thomas, 2008).

Baker, Côté, and Abernethy (2003) found support for the DMSP in team-sport Olympians, who were divided into experts and non-experts. Experts were national team members deemed by coaches as their team’s best decision-makers. In the sampling years, most experts participated in various other sports and non-sport activities, and they actually spent more time in other sports than non-experts did. Participation in several other sports was associated with relatively small amounts of practice in their sport of expertise, which further supports the role of diversification. In the specializing years, experts decreased their involvement in other activities and began to devote more time to their domain of expertise. Not until the investment years did experts spend their time primarily in their sport of expertise.

Soberlak and Côté (2003) found support for the DMSP in 20-year old elite ice hockey players. On average, players accumulated 3,072 hours of deliberate practice since age 6, well short of the 10,000 hours accumulated by Ericsson et al.’s (1993) musicians. Consistent with the DMSP, only 15% of the hockey players’ deliberate practice took place during the sampling years, but players accumulated nearly 75% of their deliberate play (on average, 3,506 hours) during this phase. In the specializing years, deliberate play decreased while deliberate practice gradually increased. In the investment years, players dramatically increased deliberate practice while engaging in little or no deliberate play.
Ford, Ward, Hodges and Williams (2009) have proposed the *early engagement hypothesis*, an alternative to the DMSP. This hypothesis states that deliberate practice and domain-specific deliberate play are most effective when youth athletes regularly engage in both. Ford et al. (2009) studied three groups of soccer players: recreational players, elite players, and ex-elite players, who failed to reach full-time professional status. The elite players engaged in more deliberate practice than recreational players did, but they also engaged in more deliberate play in soccer than ex-elite players did. These results do not fully support either early specialization, which calls exclusively for deliberate practice in one sport, or early diversification since the elite players’ deliberate play was mostly in their sport of expertise (Ford et al., 2009).

In summary, deliberate play and diversification can combine with deliberate practice to develop expertise. Although studies have not agreed on the exact combination of these three elements, they do confirm the benefits of deliberate play. By time athletes reach the college or professional level, they tend to have specialized in their sport already, so they would not likely report any diversification. However, it is reasonable to expect college and professional athletes may engage in deliberate play. Deliberate play could particularly benefit athletes in open-skilled sports, which require athletes to perform skills in unpredictable and unstable environments. The literature on deliberate practice in sport (e.g., Hodge & Deakin, 1998; Starkes et al., 1996) has suggested that activities that replicate performance are most relevant to performance. In open-skilled sports, deliberate play is the activity that most closely replicates the demands of competition. For example, shooting a basketball in a game of 5-on-5 replicates shooting in competition better than a drill does. Therefore, the current investigation will study deliberate play in addition to deliberate practice.

**Approaches to Practice and Skill Acquisition**

Since deliberate play inherently has little structure, athletes have few choices to make regarding its content. On the other hand, athletes can design the content and structure of practice to maximize improvement. Doing so is especially important for adult athletes (e.g., college and professional) who are at the highest level of competition they will reach. Still, the research reviewed so far has focused on long-term athletic talent development, starting from athletes’ youth. There seems to be little research that examines how adult athletes can best improve their performance through practice and play activities. College athletes have relatively limited time (i.e., four years) to accumulate hours of deliberate practice, and they likely practice for an
upcoming season or competition, rather than long-term development. Thus, optimizing the time they do have to practice is essential. If deliberate practice is designed especially for improvement, how does one design it that way? This section will review concrete approaches to designing particular tasks that translate into improved performance in competition.

**Constraints-led Approach**

Davids, Button, and Bennett (2008) proposed a constraints-led approach. The human body functions as a dynamical system, meaning it is one whole system rather than separate pieces. Human behavior is complex because perceptions, actions, and intentions all interact and affect each other, and it is subject to constraints. Constraints are variables that limit or enable behavior, and they can be classified as organismic, environmental, or task. Organismic constraints are a person’s characteristics that affect how the person approaches performance goals and include height, weight, cognitions, motivations, and emotions. Environmental constraints are physical or social surroundings, such as the terrain of a ski slope or cultural norms. Task constraints are “specific to performance contexts” and include the rules of an activity and boundaries of a playing surface (Davids et al., 2008, p. 41). Task constraints are especially relevant to practice because they can be easily manipulated to enhance learning.

Manipulating task constraints can optimize retention and transfer of the practiced skill to performance. For example, to train ball control and passing skills, a soccer coach can adjust rules of a small-sided game by limiting the number of touches by each player. This rule change enhances skill acquisition because it encourages players to position their body and read the trajectory of the ball so they get a good first touch, which would give them enough control to pass or shoot within the designated limit of touches. The coach does not explicitly tell players to make these adjustments. Instead, the players teach themselves as they learn how to follow the rule. Another example of manipulating a constraint is shrinking the boundaries of a tennis court to improve the accuracy of groundstrokes. If players need to work on hitting crosscourt, then shots hit “down the line” could be considered out. This constraint would condition a player’s swing more effectively than verbal instructions from a coach would (Davids et al., 2008). The constraints-led approach helps athletes and coaches realize they have the ability to determine the effectiveness of practice if they think critically about the design of drills and activities.

A key benefit of a constraints-led approach is that it focuses on the uniqueness of the individual. Recall that practice is deliberate if it is designed specifically to improve the
performer’s weaknesses (Ericsson et al., 1993). Because most research on deliberate practice has been nomothetic, it has defined deliberate practice according to general categories of activities. A constraints-led approach emphasizes the need for athletes to design practice with their unique needs in mind. For example, a right-handed basketball player who needs to practice dribbling with his left hand could design a drill where a defender forces him to drive to the left. He concentrates his time and energy on the skill that needs the most improvement. In short, he ensures the task is in his “learning zone.”

**Play Practice**

Another approach to maximizing the effectiveness of practice is Play Practice (Launder & Piltz, 2006). Drawing on the contributions of play to skill development, it takes a “games approach” in which participants learn skills by playing games of the particular sport modified to emphasize those skills.

Play Practice has three main principles. The first is “shaping the play,” or the modification of the sport to allow participants to learn skills without being overwhelmed by all the pressures of a full game. For instance, a soccer coach can reduce the number of players in a game so that there are more attackers than defenders. He could start with games of 4-v-1 so that players can practice both technique and tactical understanding, but without too much pressure from defense. Then the coach can gradually add more defenders and offensive players.

A second principle of Play Practice is that specific techniques are emphasized in these modified games. A coach can use the same game to teach a certain skill one time and a different skill another time. She could have a game of 3-on-3 basketball that emphasizes passing and cutting to the basket by penalizing a team with a turnover if a player does not cut after passing. The coach could also use 3-on-3 to stress getting defensive “stops” by rewarding teams with a point each time it prevents its opponent from making a basket.

The third principle of Play Practice is “enhancing learning” by ensuring participants put their greatest effort into the game (Launder & Piltz, 2006). A coach can do this by limiting the length of a small-sided game to three to five minutes. When players realize that every play or minute counts, they develop a sense of urgency to maximize their effort, and more effort leads to more learning and improvement. Previous research (Helsen et al., 1998; Starkes et al., 1996; Hodge & Deakin., 1998) found activities that replicate performance improve performance the
most, and Play Practice embraces these findings by requiring athletes to perform tasks in the conditions that mirror competition, such as game speed or the presence of defenders.

**Contextual Interference**

If Play Practice explains *what* athletes should do for effective practice, research on contextual interference explains *why* these small-sided games teach skills effectively. Contextual interference is the interference that occurs when one task is performed among different tasks (Porter & Magill, 2010). With low contextual interference, trials are done in blocks of each task, so a baseball player might practice hitting five fastballs, then five curveballs, and then five change-ups. In high contextual interference, trials of different tasks are done in a random order. The baseball player would practice hitting a random combination of curveballs, fastballs, and change-ups. A basketball player could also add contextual interference by practicing chest, bounce, and overhead passes in a random order. High contextual interference mimics competition since a batter does not know for sure what pitch to expect in a real game and a basketball player makes a certain type of pass depending on situational factors, such as the location of players on the court. Accordingly, Play Practice creates contextual interference by simulating these competition conditions.

A constraints-led approach, Play Practice, and the use of contextual interference recognize that performance in competition is more important than performance in practice. It is true that the variability in these forms of practice contradicts the condition of deliberate practice that states the same task is repeated many times, but Schmidt (2008) has supported the notion that variability in practice actually promotes performance in competition. Practice can result in permanent learning, which involves developing a skill well enough to execute it in competition. However, practice can also result in temporary improvement that can give athletes a false sense of confidence. Consider the golfer who continuously hits the same shot with the same club and target at the driving range. He might hit the first one poorly, but he observes what he did wrong, adjusts accordingly, and hits the next one better. After several shots, this cycle of feedback and adjustment leads him to hit his target consistently, but this improvement likely dissipates by the next day in a real round of golf because he never hits the same shot repeatedly like he did on the driving range. Approaches that focus on the transfer of skills to competition make performance in practice more difficult for athletes, but good performance in practice is not the goal of
practice. Rather, practice should be designed to achieve permanent learning, which cannot be judged until competition.

**Do Athletes Engage in True Deliberate Practice?**

While research has clarified what athletes should do in practice, what they *actually* do may fall short of deliberate practice. Video of wrestlers and figure skaters showed they spent little time doing the activities they rated as most relevant to performance (Starkes, 2000). First, wrestlers spent only 8% of practice in full sparring, despite rating it as most relevant, and they spent more time warming up and cooling down even though those activities were least relevant. Second, figure skaters cited certain advanced jumps as critical for performance success, yet they spent most of practice working on jumps already well-learned (Starkes, 2000). Deakin and Cobley (2003) found that elite figure skaters overestimated the amount of time spent on challenging skills. The skaters said they would attempt an average of seven double jumps and 20 triple jumps in practice, but they actually attempted an average of 30 doubles and only six triples. A possible explanation for this tendency is that athletes are afraid to fail, even in practice, but that fear of failure precludes improvement and extends the fear into competition.

The microstructure of practice can also be attributed to coaches, who choose what athletes do in practice. In team sports such as basketball and soccer, practice activities can be divided into “playing form” and “training form” activities. Training form includes physical conditioning and drills that isolate a single skill. These drills are based on the assumption that performance depends on mastering parts of a skill separately before putting them together in a game (Ford et al., 2010). Training form activities are important for learning new skills, but less effective for mastering the skills because they do not simulate competition.

In contrast, playing form activities include small-sided games, such as those recommended by Launder & Piltz (2006). These games improve performance because they require the athlete to perform skills under demands that mirror competition. For instance, if a basketball player is working on a crossover dribble in a small-sided game, he must recognize the appropriate situation to use that dribble and execute it well enough to “beat” a live defender. In light of the principles of deliberate practice, the effectiveness of playing form activity is logical. Once a skill is learned by performing it in a drill, repeating that drill likely falls into an athlete’s “comfort zone,” but the demands of playing form activity could push the athlete into his “learning zone.”
Despite the recommendations for playing form activity, coaches tended to overemphasize training form activity (Ford, Yates, & Williams, 2010). Video of 70 youth soccer practices of teams in three different age groups showed that all teams spent the majority of practice time in training form activity. On average, teams spent 65% of practice in training form activity. The emphasis on training form activity revealed a gap between what research recommends for enhancing performance and what athletes actually do.

Partington and Cushion (2011) advanced this research on practice activities by examining why coaches continue to stress training form activity. Like Ford et al. (2010), Partington and Cushion (2011) reviewed video of soccer practices and found coaches had their teams spend more time in training form than playing form activity. In qualitative interviews, the coaches said they derived their practice content and coaching techniques from traditional methods and older coaches, not from evidence-based research. Some coaches did report agreeing with research on playing form activity, but they did not integrate it into their practices. This cognitive dissonance, in which coaches advocated one approach but utilized another, reflects a potential lack of understanding of research or how to implement research. For example, coaches excused their lack of playing form activity by citing a lack of space, but small-sided games can still take place in small playing areas (Partington & Cushion, 2011). Although coaches may know what skills to practice, the reluctance to utilize playing form activity reflects a larger concern that coaches do not pay enough attention to how their teams practice.

**Statement of Purpose and Research Questions**

It seems important to extend Partington and Cushion’s (2011) research by investigating how athletes approach practice outside of organized team practices. The story of Bill Bradley that opened this chapter is just one example of a successful athlete’s work ethic and suggests the value of practicing alone. Nonetheless, most research on practice microstructure has studied only team practices that are run by coaches (e.g., Ford et al., 2010; Partington & Cushion, 2011). There is little research on how athletes practice outside of team practices or athletes’ perspectives on practice, so the current study attempted to fill these gaps in the literature.

**Purpose**

The purpose of this study was to examine NCAA Division I athletes’ experiences of, attitudes toward, and approaches to practice outside of formal practices led by coaches (“individual practice”). The term “individual practice” was used to describe any activity that an
athlete does to improve sport-specific skills for competition, such as deliberate practice and
deliberate play. It excluded practices with the whole team run by coaches, but it included athletes
practicing with other players. When athletes practice with other players, the practice is still
“individual” in the sense that they still focus on their own individual skills. The broad use of the
term “practice” was appropriate because this study intended to explore the range of activities
athletes do to improve.

Understanding how athletes experience and approach practice is important for athletes,
coaches, and sport psychology consultants. It may indicate how well athletes adhere to the
principles of deliberate practice and reveal what can prevent athletes from engaging in deliberate
practice. If they adhere to deliberate practice, how did they come to develop such habits? If they
do not adhere to deliberate practice, perhaps they are not aware that their improvement depends
on the way they design practice, or there could be psychological factors, such as fear of leaving
one’s “comfort zone” for their “learning zone.” This knowledge can be used in further research
on how to educate athletes to commit to deliberate practice.

Off-Season

Much individual practice was expected to take place during the off-season. The off-
season is a critical period for athletes because it is their opportunity to improve as individual
performers by working on weaknesses, re-configuring their techniques, or adding new skills. For
example, during the competitive season, a basketball post player who is a poor outside shooter
would probably focus on post moves rather than experiment with outside shots, but she might
work on her outside shot during the off-season. In fact, Cumming and Hall (2002) found that
athletes at higher competitive levels engaged in significantly more physical and tactical
preparation during the off-season than athletes at lower competitive levels did. Athletes generally
have autonomy to choose what and how they practice outside of organized team practices, and
practicing in a way that maximizes their improvement and skill acquisition is critical. Several
studies have explored the effectiveness of off-season strength and conditioning programs (e.g.,
Moore & Fry, 2007; Moore, Hickey, & Reiser, 2005), but few studies have investigated practice
of sport-specific skills during the off-season. A first step in this line of research would be to
understand how athletes currently practice during the off-season.

Team Invasion Sports
Many sports involve closed skills, which are performed in a predictable and stable environment. In swimming, the distance and stroke are known before each race starts and do not change throughout the race. These sports also tend to lack “head-to-head” competition, in which teams actively try to disrupt each other from performing. In ice skating, for example, the winner is determined by comparing skaters who separately perform set programs.

In contrast, team invasion sports (Gabbett, Jenkins, & Abernethy, 2009; Lorains, MacMahon, Ball, & Mahoney, 2011) involve two teams that alternate between “attacking” a goal and defending it from each other. Ice hockey, for example, involves two opposing teams that score by shooting the puck at the net defended by the other team. These sports, which also include basketball and soccer, require various open skills, or skills that must be executed in unpredictable or unstable environments. For instance, exactly how, when, and where on the court basketball players shoot, dribble, or pass depends on continuously changing factors, such as the positioning of teammates and pressure from defense. This study focused on team invasion-sport athletes because they have many decisions to make regarding the design and content of their practice to prepare for the unpredictable situations they face in competition. Furthermore, team invasion sports have been the subject of previous studies on practice content (e.g., Ford et al., 2010; Launder & Piltz, 2006; Partington & Cushion, 2011).

Research Questions

This study’s primary research question was: what are athletes’ experiences of, attitudes toward, and approaches to practice outside of formally organized practices led by coaches? Four sub-questions were: a) What do athletes do to practice outside of formal coach-led practices?, b) How do their approaches to practice compare to research-based recommendations for practice?, c) How do athletes come to design the content of their practice the way that they do?, and d) What do athletes believe about their ability to maximize the effectiveness of practice?
CHAPTER TWO: METHOD

Research Approach

This study utilized a phenomenological approach. Phenomenology focuses on participants’ experience of a phenomenon and assumes that the reality of that phenomenon can only be understood through participants’ experiences of it (Schram, 2006). In other words, there is no objective reality. The phenomenon in this study was individual practice. While theory has already proposed what athletes should do to practice, this study attempted to clarify how athletes experience what they actually do, so phenomenology seemed an appropriate approach.

Phenomenology, however, is not just a collection of the unique experiences of different participants, for it attempts to describe experiences and meaning that are fundamental to the phenomenon (Schram, 2006). Similarly, a goal of this study was to identify the thoughts and considerations that influence athletes’ choices about practice.

Participants

Because qualitative research attempts to elicit in-depth information about a phenomenon, sample sizes are usually smaller than those in quantitative studies that attempt to generalize findings to larger populations. When the sample is large, the in-depth information is difficult and time-consuming to generate (Cresswell, 2007). Samples still have to be large enough to make meaningful comparisons, and Cresswell (2007) recommends sampling to the point of theory-saturation, when new data do not give new information about the social processes under study. This number of participants can range from 1 to over 300, but studying 3-10 participants is recommended (Cresswell, 2007).

To select participants, qualitative research tends to use purposeful sampling. The researcher selects participants who “can purposefully inform an understanding of the research problem and central phenomenon in the study” (Cresswell, 2007, p. 125). In phenomenology, participants need to have experienced the phenomenon in the study, so criterion sampling is a useful strategy. Criterion sampling requires participants to meet some criteria related to the phenomenon.

For this study, inclusion criteria was participation in a Division I team invasion sport and some engagement in individual practice for that sport. Participants were nine male and female athletes in basketball, ice hockey, field hockey, and soccer (See Table 1). Coaches were informed of the purpose of the study and asked to recommend athletes they believed could
provide information on the topic. These athletes were then contacted via e-mail and asked to participate in the study. Although this sample did not represent all collegiate athletes, this study did not attempt to generalize to the entire population of collegiate athletes. Rather, it sought to learn in-depth about individual practice from some who had engaged in individual practice.

**Table 1**

**Profile of Participants**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Sport</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Male</td>
<td>Basketball</td>
<td>Guard</td>
</tr>
<tr>
<td>P2</td>
<td>Female</td>
<td>Basketball</td>
<td>Guard</td>
</tr>
<tr>
<td>P3</td>
<td>Female</td>
<td>Basketball</td>
<td>Guard/Forward</td>
</tr>
<tr>
<td>P4</td>
<td>Male</td>
<td>Ice Hockey</td>
<td>Forward</td>
</tr>
<tr>
<td>P5</td>
<td>Female</td>
<td>Basketball</td>
<td>Guard</td>
</tr>
<tr>
<td>P6</td>
<td>Female</td>
<td>Soccer</td>
<td>Midfielder</td>
</tr>
<tr>
<td>P7</td>
<td>Female</td>
<td>Field Hockey</td>
<td>Defender</td>
</tr>
<tr>
<td>P8</td>
<td>Female</td>
<td>Field Hockey</td>
<td>Defender</td>
</tr>
<tr>
<td>P9</td>
<td>Female</td>
<td>Field Hockey</td>
<td>Goalkeeper</td>
</tr>
</tbody>
</table>

**Qualitative Interviews**

Data were generated through qualitative interviews with participants. An interview is distinct from a conversation, which typically involves reciprocal disclosure from each party, because an interview is an asymmetric process in which the interviewer seeks information while the interviewee provides it (Shank, 2006). In addition to asking questions, the interview process also requires the interviewer to listen, including keeping the research question in mind and determining whether the question asked has been answered.

The purpose of qualitative interviews is “to learn about what you cannot see and uncover alternative explanations of what you do see” (Glesne, 2011, p. 104). The researcher tries to gain insight into the participant’s world, identify themes of that world, and uncover concrete examples of actions and settings that support those themes (Shank, 2006). Glesne (2011) recommends *topical interviewing*, which focuses on people’s attitudes, perceptions of issues, programs, and processes, instead of facts about people’s lives or past events. Similarly, while this
study did explore what athletes do, interviews concentrated on athletes’ attitudes and opinions about practice.

One-on-one interviews were conducted by the lead researcher with each participant. Before the start of the interview, the researcher explained the purpose and nature of the study to the participant, assured confidentiality, and obtained informed consent. Next, “individual practice” was defined as activity that the participant does outside of formal coach-led practices to improve his or her sport-specific skills (e.g., shooting or dribbling in basketball). Although strength and cardiovascular training was an important aspect of athletes’ preparation for competition, interviews focused on sport-specific skills since practicing them replicates what is done in performance.

Interviews were semi-structured. In semi-structured interviews, the researcher follows an interview guide of pre-planned questions that the researcher can supplement with follow-up questions. The researcher has flexibility in the phrasing and order of questions (Glesne, 2011; Shank, 2006) but asks all interviewees are the same questions to keep the interviews comparable.

The interview guide for this study (Appendix A) was designed to keep the interview focused on answering the research questions. The first task in interviews was to build rapport with participants by asking about their general participation in their sport. Because these initial questions were broad, the participants could answer them easily and become comfortable talking to the researcher. Next, a “grand tour” question asked participants to give a broad overview, or grand tour, of what they do to improve their performance (Shank, 2006). The purpose of this question was to set up more specific questions and continue building rapport.

Although some interview questions addressed multiple research questions, the rest of the interview guide was divided into four sections. The first asked participants to describe what athletes did in practice and how often they practiced. The second section focused on their approaches to practice, including how they plan practice content and how they structure practices. The third section asked about participants’ experience while practicing, and the fourth section investigated their attitudes toward practice. Probe questions were often asked so participants would clarify or elaborate on previous answers. Glesne (2011) emphasizes the importance of probing patiently and states that researchers should not move onto the next question until they have stopped learning from the previous one. Each interview ended by giving
the participant the chance to add any insight he or she thought might be relevant to the researcher’s understanding of practice.

**Data Analysis**

According to Miles and Huberman (1994), qualitative researchers should begin data analysis while still collecting data. Early data analysis helps researchers consider new strategies for collecting data, re-evaluate assumptions, and avoid having an overwhelming amount of data to analyze all at once after data collection is finished. In the current study, the first step in this process was to complete a contact summary sheet (Appendix B) immediately after each interview. This sheet was a single piece of paper with questions that the researcher answered to summarize the key points of the interview (Miles & Huberman, 1994). Reflecting on each interview in writing helped the researcher to keep thoughts organized and to communicate the key points to collaborators.

More in-depth analysis followed the contact summary sheet. Interviews were transcribed and then coded line-by-line. Coding involved applying labels to words, sentences, or whole paragraphs, or “meaning units.” A meaning unit is “a segment of text that is comprehensible by itself and contains one idea, episode, or piece of information” (Tesch, 1990, p.116). Following an inductive approach (Patton, 1990; Shank, 1996), this analysis started with a collection of specifics before gradually uncovering more general patterns, and codes were named in the process, rather than determined *a priori*. When possible, they were named *in vivo*, or in the participants’ words (Glesne, 2011). However, the theories that have guided the study did influence some names. For example, some data were labeled “deliberate play.”

Data analysis is a selective process since the researcher has to determine which data are most relevant to answering the research questions, and coding helped this process by grouping and differentiating data. Researchers could then more easily find data relating to a certain research question or construct. Consistent with Miles and Huberman’s (1994) guidelines, coding took place as data collection was ongoing. Codes were initially descriptive, but as analysis progressed, they became more interpretive and were organized into themes, sub-themes, and categories. The purpose of this process was to make sense of the data by answering the questions, “What is being illuminated? How do the stories connect? What themes and patterns give shape to your data?” (Glesne, 2011, p.194).
Validity

Although the term validity is traditionally associated with quantitative research, qualitative research can have validity in the sense that it is “plausible, credible, trustworthy, and, therefore, defensible” (Johnson, 1999, p. 160). Two analytical strategies were used to enhance validity. The first was investigator triangulation, which ensured descriptive validity, or the accuracy in reporting behaviors, settings, events and other descriptive information. It involved the use of three analysts to analyze the data. The two researchers first independently coded the interview transcripts, cross-checked their coding, and discussed any differences until agreement was reached. Next, following the procedure by Galli and Vealey (2008), a third analyst previously unaffiliated with the study was given a sample of 105 meaning units and asked to place them in the themes, sub-themes, and categories previously developed by the two researchers. The independent analyst and researchers were in agreement on 83 out of 105 meaning units (79%). This general agreement between investigators increases the trustworthiness of whether what is reported actually occurred (Johnson, 1999).

The next strategy was member checking, or receiving participant feedback. Sharing interpretations of participants’ words with the participants allowed participants to clarify any miscommunication and identify any inaccuracies to be re-interpreted. Each participant was e-mailed the transcript of his or her interview and a summary of the researchers’ interpretations of the interview, and he or she was asked to verify their accuracy or identify any inaccuracies. Participants did not report any inaccuracies or add any new information. This process increased interpretive validity, or the accuracy with which researchers have portrayed the meaning participants attached to material discussed in interviews (Johnson, 1999).
CHAPTER THREE: RESULTS & DISCUSSION

This study’s primary research question was: what are athletes’ experiences of, attitudes toward, and approaches to practice outside of formally organized practices led by coaches? Four sub-questions were: a) What do athletes do to practice outside of formal coach-led practices?, b) How do their approaches to practice compare to research-based recommendations for practice?, c) How do athletes come to design the content of their practice the way that they do?, and d) What do they believe about their ability to maximize the effectiveness of practice? From an inductive analysis, seven main themes of meaning units emerged: Importance of Practice, Antecedents to Practice, Frequency of Practice, Practice Content, Practice Structure, Quality of Practice, Psychological Experience. These themes were divided into sub-themes, and some sub-themes were further divided into categories (Table 2).

**Importance of Practice**

Although some participants acknowledged that natural talent has some role in determining performance in competition, most emphasized the importance of practice to their performance. Two sub-themes that emerged from their discussion were: a) work ethic and b) the need for individual practice.

**Work Ethic**

Participants tended to attribute performance to hard work. They associated a strong work ethic with doing more work than the minimum and took pride in it.

*There’s a lot of skilled players out there. I wouldn’t say I’m the most skilled, but I think I have a really high work ethic: willing to put the time in outside of practice, willing to push yourself those few extra sprints.* (P5)

*Definitely to get to this level [NCAA Division I], you have to have that hard work ability and have to be really determined...Once you get to the higher levels, everybody has high-end skill players, but not everybody moves on. You can have kids who have the most skill in the world but don’t have the work ethic or don’t want to do the other littler things and they don’t move on, where there are other guys who have very little skill but have gone on to make NHL careers out of it because of how hard they work and how disciplined they are to the game.* (P4)
I think you have to work hard to be able to accomplish what you want to do, and I think that’s a big part of it, that I’m really grateful though, that whoever taught me that, it really stuck with me and is a great skill to have: that you’re willing to work and go outside of your comfort zone and outside of what is expected of you. (P8)

Obviously athleticism and size is really big, but I mean if you have a lot of athleticism and a lot of size and don’t work hard, you’re not going to excel, so I think the main thing, the most crucial aspect is definitely work ethic. (P1)

Need for Individual Practice

Individual practice was viewed by participants as an opportunity to practice skills that they are not able to improve in team practice, which tends to focus on team concepts such as an offensive system or preparation for a particular opponent.

You don’t necessarily have a lot of skill work going on in practice, working on your ballhandling, your dribbling, your shooting. So I think that work ethic comes down to getting in the gym by yourself or with a couple guys and do more isolated type of work. (P1)

Sometimes the coach will say “I want you to work on your hit” or something like that. A lot of times in practice, we don’t get a lot of time to do that kind of stuff. A lot of times we’re scrimmaging or we’re doing big drills and we don’t get a lot of touches on the ball, so I realize if I really want to improve, that’s [individual practice] what’s going to have to happen. (P8)

P8, a field hockey player, provided an example when she worked on a particular skill:

I was really trying to work on my aerial flick, which is basically when you flip the ball over everyone’s head into an open field, and so I was really trying to work on that this season. So there were a couple days, especially near the end of the season, where I would maybe once, twice a week...stay after practice for 10, maybe 20, minutes to try to get some extra work on that because that specific skill I couldn’t practice in [team] practice time.
Table 2
Overview of Themes, Sub-themes, & Categories

Importance of Practice
- Work Ethic
- Need for Individual Practice

Antecedents to Practice
- Scheduling of Practice
- Motivation to Practice
  - Urgency to optimize performance
  - Role model
- Barriers to Practice

Frequency of Practice

Practice Content
- Skills Practiced
- Working on Weaknesses
- Simulating Competition
- Sources of Content
  - Coaches
  - Own ideas
- Deliberate Play

Practice Structure
- Planning of Content
- Repetition
- Monitoring Performance
  - Systematic monitoring
  - Monitoring by feeling
  - Feedback from others
  - Effort
- Goal-setting

Quality of Practice
- High Quality
  - Game speed
  - Purposeful practice
  - Pushing self
  - Mindset
- Low Quality

Psychological Experience
- Stress Relief
- Positive Affect
- Confidence
- Negative Affect
- Thoughts during Practice
- Autonomy
The off-season is also an opportunity to focus even more on individual skills. P4 compared working with a trainer during the summer to team practices during the season:

*It’s a lot more skill design practice, where you’re improving your skill. Where if you’re out working with your team, you’re more working on your system, like your overall team system where you have to beat the other team. Where with this guy [trainer] during the summer, it’s more skill-based where…you’re not preparing for any team. You’re just trying to develop your skills…When you’re practicing as a team, it’s a lot more team focus, what you have to do within the team to win. Whereas individually, you’re [asking], “what can I do to make myself personally better?”*

P1 discussed staying on campus over the summer to work on his skills:

*The days are so long because you’re here and not too many people are on campus that you actually have a lot more time to do stuff on your own in the gym, which I liked. I liked being here just because maybe if I was at home I wouldn’t set aside so much time because I’d have other things to do. So…it gives you a big chunk of the day when you can try to be productive in the gym.*

P2 added that she can work on expanding her skill set in the summer:

*I guess in season, practices are more specific to certain skills. Like I said, if some games you struggled with ballhandling, you know you’re going to spend extra time working on ballhandling. Whereas off-season, I think you work on a wider range of your skills, just because you don’t have that one thing to focus on. I mean your coaches give you some things to focus on, but I would say I try to work on more skills but also developing some aspect that I didn’t feel was as strong or developing a new move or something…I’ve never been a really deep three-point shooter, so this last off-season, so this summer, my coach really emphasized working on my three-point range.*

Another reason for individual practice was to adjust to the higher level of competition in college compared to high school. P7, a field hockey player, discussed her initial experience competing in college:

*My freshman year, I noticed I needed to work on my hit. It just wasn’t as strong…Being in high school and college, it’s such a big difference. I came in thinking it was fine, and then I realized, no: there is a huge difference. So I would stay after practice, some girls would too, and that’s all we would work on—just hitting constantly—and it helped.*
P1 explained that individual practice prepares athletes for competition by turning execution of skills into habits:

*I’ll go into a practice session with an idea of things I want to work on. So if there’s a certain thing...if I’m not holding my follow through on my jump shot, I’ll try to make a conscious effort on every single shot to hold my follow through because [basketball is] a game where you got to develop habits. So...when you shoot a lot, that’s because you want to develop a habit, have the same feel every time you shoot it. You don’t want it to feel on one day and off the next. It should always be consistent, and you want to form habits in what you do. And same for ballhandling. I just have certain little techniques I might focus on. I try to focus on them on my own because when in the game, it’ll just be habit.*

He elaborated that developing skills into habits makes him more comfortable executing them during competition:

*For individual practices, I think it’s just important, like I said, developing habits, so whether it’s your jump shot or habits making reads or certain plays, certain game-like situations you might practice by yourself, it’ll help things be a lot more comfortable when you’re nervous or going against an opponent that’s a lot bigger than you or something like that. If you have confidence in those habits that you’ve developed, it slows things down a lot.*

### Antecedents to Practice

Antecedents are behaviors or cognitions that preceded individual practice. Three sub-themes describe common antecedents: a) scheduling of practice, b) motivation to practice, and c) barriers to practice.

#### Scheduling of Practice

To engage in individual practice is a choice, so athletes are responsible for finding time for it. Several participants found that scheduling a time to practice in advance helped ensure they incorporated it into their day. P1 said:

*I usually find a time within the day that I tell myself at the beginning of the day “this is when I’m going to go,” and that just makes it a lot easier. I try not to go the whole day and then realize that night I need to get in [the gym], but that might be the time I go...is late at night.*
P6 discussed how she plans her practice during the summer: “I’ll usually set...a schedule, so it’s not just spontaneous. I try to get it done either in the morning, so I have the whole rest of the day to relax and feel good about what I did.” P9, a field hockey player, reported practicing on her own four times a week. She said, “It’s not always the same day, but I have a calendar obviously for everything, and then once a week, like at the beginning of the week, I put [practice] in.”

Other participants seemed to choose to practice spontaneously rather than schedule practice in advance. P7 said:

_Sometimes I’ll think “maybe today I’ll stay after because I have some time” but sometimes it’s just like, “Oh, I feel like going down to the field and playing” or if I’m bored in my room and I’m feeling cooped up or something. Normally, I would say that they’re not planned._

P8 seemed to decide to practice extra based on whether she felt she needed to work more on a skill:

_I would say if it was a really hard practice and we’re just worn out or I have a lot of homework, I would choose not to [practice individually]. But if there’s something that I really need to work on, either my coach has told me or I can just tell, I really need to work on something, and I’m not as tired maybe, then I’ll stay after or go before practice._

**Motivation to Practice**

According to Ericsson et al. (1993), deliberate practice “is not inherently motivating” (p. 368). That is, athletes do not derive any enjoyment from engaging in the actual process of practicing. Instead, they are motivated by the resulting improvement. Individual practice is voluntary, so participants said self-motivation was important for staying committed to individual practice. Two sub-themes emerged from discussing sources of motivation: a) urgency to optimize their performance, and b) the responsibility to be a role model.

**Urgency to optimize performance.** Multiple participants said they spent extra time practicing because they recognized they only have a limited time to achieve their best performance in college. P3, a basketball player, reflected on preparing for her senior season:

_I think it’s just one of those things that you realize, especially as a senior, the urgency, like it’s my last year. You know, I want to go out, I want to go out big, so I’m working towards that [conference] ring...As a freshman, you come in and think you know what
you want and you think you know what’s going to happen, but the reality of it is you
don’t, you never have a clue. So by senior year, I think it’s just one of those things where
it’s like “if I can’t motivate myself by this point in time, then who can?” And so it’s one
of those things where you’re either going to get after it and you’re going get the most out
of it and you’re going to look back with no regrets, or you’re like “well, I wish I had
practiced on my own” or “I wish I had done this on my own.” So it’s almost like a fear of
regretting things at this point, it’s like I want this and I have to work for it, so why should
anyone else be motivating me when I want it?

This sense of urgency was not limited to seniors. P7, an underclassman, recognized that athletes
generally have only four seasons to compete in college:

I love to practice. I love the sport. I find it enjoyable, and you only have four years here,
so I feel like you need to be the best you can for those four years or else, I mean, it’s not
really worth it. So I think I’m just trying to get the best out of it while I can, while I’m
here. So I think my attitude’s really good. I feel like I’m always excited to go to practice
or excited for games and that kind of thing.

**Role model.** While the purpose of individual practice may be to improve one’s own
skills, some athletes sensed a responsibility to be a role model for others. P5 said:

There’s also a sense of pushing others. If people see me working hard, they’re going to
step up their game. But if they see me going through the motions, they’ll be like “Oh,
that’s okay.” Especially...our underclassmen, we’re trying to set an example as
upperclassmen, like “That’s not what you do. You push yourselves to get better because
we want to get better as a team.”

She added:

One of my main values is I want to set a good example. I want to be a role model, not
only for my teammates but also for other people who come to watch and they’ll be like
“Wow, you can tell that girl works hard” or “You can tell she enjoys this sport” or “She
has a lot of fun,” something like that. But, yeah, I definitely take pride in leading by
example.

Setting this example enhances her rapport with teammates:

I also think [individual practice] shows a lot about your character as well, in the sense
that if you’re willing to put in the extra time, [teammates] can count on you to do
different things because they know you’re putting in the extra time because you want to do well for the team. That goes a long way with me anyway.

Similarly, P9 discussed individual practice as a way to embrace her role as a captain of her field hockey team:

*I want to be some kind of role model in that sense…in the beginning [of my career] I didn’t really ask to be a leader, but then once you get used to the position and you like it a lot, then you want to keep it. I think that is what it is now since I know I have that standing now, but I don’t want to be…satisfied with it…because I know it’s easy to lose too.*

**Barriers to Practice**

Despite having various sources of motivation to practice, participants also acknowledged they struggle to engage in individual practice some days. P1 mentioned that other obligations make fitting individual practice into his schedule difficult:

*A lot of the times it’s hard to get into the gym by yourself because you get a lot of school stuff, places you got to be for basketball besides just practice. There’s other stuff we got to do too [for basketball]. The biggest con is not finding time, so you might put basketball over some other things that might have a higher priority.*

P6 added:

*It can be really hard sometimes to be motivated and do that [practice]. Especially if it’s summer and you want to be out with your friends, just relaxing after the season, so it’s hard to motivate yourself and take time away from all that stuff.*

P2 noted that when she does get in the gym to practice, motivation to work on weaknesses is limited:

*My weaknesses are probably weaknesses because they’re things I don’t really like to work on. I mean, I don’t really like to sit there and work on ballhandling because that’s kind of boring to me…and it’s hard to work on finishing. It’s easy to sit there and shoot threes, which is one of my strengths. Or sit there and off the pass pull-ups or jumpers because that’s stuff you can do on your own, but things like finishing or rebounding…[are harder to practice].*
Sometimes athletes may decide not to practice individually to avoid physical exhaustion since they already practice or compete with the team most days during the season. P4, the ice hockey player, said:

*You kind of have to listen to your body at times. I find that there’s going to be days and weeks when you have too much schoolwork going on or your body’s just not there, so you can’t go as hard. Where other weeks, you’ll feel great, so you’ll have more time after to do other activities, so I think it varies. Usually, guys a couple times a week will try to do other stuff.*

P8 stressed how much time and energy practicing with the team requires:

*During season we practice for two or three hours, five times a week with one day off plus games on the weekends. So it’s kind of more in your benefit to rest outside of practice, and outside of lifting and stuff. And our time’s so structured, like this past spring, our time block was two to about six-ish, and that’s including running, conditioning, practice, and all that stuff, so afterwards, we just kind of want to do homework instead of go and do extra work.*

Because teams hold practices outside of their competitive season too, the periods when they do not have practice, such as the summer, can also be a time for rest. P6 said:

*Definitely, I mean it’s enough, a lot of soccer while I’m here, so when I get home I like to take a break so I don’t get overworked or stressed out or anything, so I think it’s just good to keep it at a moderate level so I can balance it out.*

Being physically rested for times when they do engage in individual practice helps ensure it is high quality practice:

*Especially this summer, I would run in the morning, lift in the morning, and then I’d try to go shoot later on in the evening. But...my body’s already taxed to where it would be pointless for me to go and shoot, so it’s like “Maybe I should just wait ’til the next day when I’m not doing that stuff in the morning.” So it’s just kind of an indicator of my mood and also my body telling me “You’re tired, you can’t do this.”* (P6)

**Frequency of Practice**

Participants were asked how often they engage in individual practice to provide a sense of its role in their lives as athletes. The frequency of individual practice varied within the sample. P9 said she practices on her own four times a week, and P1 said he practices “just about every
day for about an hour or hour and a half.” Other participants said they practice less often and less consistently:

*Sometimes we’ll stay after practice or if there’s a skill I want to work on, something special I wouldn’t do in practice, for about 30-ish minutes or I’ll come before practice and shoot around or something like that.* (P7)

Quantity of practice also depends on the time of year. Most participants tend to practice individually more during their off-season. P5 said that during the summer, “I was in the gym probably almost every day. At least five days a week. Some [weeks] it would be six or seven.” She also said she spends more time in each practice session in the off-season than in season:

*I’d say my practice time by myself is longer during the off-season just because we don’t have those organized practices whereas, like I told you, after practice now, we’re there so long anyways it’s like “I want to leave,” so definitely shorter.*

Furthermore, some athletes spent more time in individual practice in high school than in college:

*During season or my time here, I don’t practice that much on my own, just because that’s the time here I spend with the team in practice. In high school, though, just because my time was not so structured, I did a lot on my own because you don’t get that much time on the field with the team, and you don’t get that many touches on the ball, so you really are required to do a lot on your own and you have to be really disciplined to make yourself do that. But I don’t find that it would be very beneficial to do a lot on your own here, except maybe during winter break or summer times.* (P8)

**Practice Content**

Practice content refers to what athletes do to practice. This theme is divided into five sub-themes: a) skills practiced, b) working on weaknesses, c) simulating competition, d) sources of content, and e) deliberate play.

**Skills Practiced**

Individual practice is an opportunity for athletes to practice individual skills. To provide an idea of what their practice involves, participants were asked which skills they practice. P2 said:

*Another goal was just to get stronger taking the ball to the basket...because I don’t really finish a lot when I go in: I’ll stop and pull up in the paint. So I was working a lot on*
finishing to the basket. So I did a lot of drills where I’d start at the top of the key, do a dribble move, and finish all the way instead of going up for a jumper and when I’d get the ball off a rebound making sure my first instinct wasn’t just to kick it back out. Because I’m a guard and I’m kind of small, working on finishing inside was going to be helpful.

P6, a soccer player, focused on crossing:

*Crossing’s a big one for me, so just pinpointing where I want the ball, practicing that, getting some reps… I usually have the target where I want them inside the box, and just dribble down the left side, and then have them stand wherever they want the ball. And then, can do low, high, can practice all different variations.*

P9, a field hockey goalkeeper, described practicing her reaction time by doing:

*Things like throwing balls against walls or with other friends of mine—so they just throw them at me or I have to turn quickly and they just put balls wherever, so I have to react fast. Or catch something real fast, like have something in my hands and make something fall, and I just catch it.*

While most participants noted multiple skills that they practice, P7 found the number of skills she could practice to be limited: “You would see me probably around the goal, because when you’re by yourself it’s kind of hard to do anything that doesn’t involve shooting or something like that…” Recall that the rationale for studying team-invasion sports, such as field hockey, was that they involve various open skills that athletes could practice. Thus, this discrepancy could suggest a limitation to practicing a team sport alone. However, it could also indicate that some athletes lack an understanding of how to practice other skills alone or a willingness to do so.

**Working on Weaknesses**

The choice of which skills to practice may depend in part on which ones are suited for individual practice, but it may also depend on which skills the athlete needs to improve the most. Ericsson et al. (1993) stated that in deliberate practice, “Specific tasks are invented to overcome weaknesses.” According to Colvin (2008), these tasks must be in a performer’s “learning zone,” where the performer is challenged just beyond his or her current abilities. In competition, performers cannot afford to commit the mistakes that working on weaknesses involves, nor do they repeat the skill enough to truly understand and practice a weakness. In team practice,
athletes may avoid risking a mistake if they are being evaluated by coaches. Individual practice, on the other hand, seems to be an optimal time to practice weaknesses. Athletes can choose how many repetitions they do of a certain skill, and they are free from the pressure to avoid mistakes. P3 explained how she continues to practice shooting from places where she struggles:

*I definitely focus more on my weaknesses... I'll go in and start close to the hoop, and once it gets very routine I get kind of bored with it so I move out a little farther and then you know I'll go around the arc and do five or seven spots, and if there’s a spot I struggle with, I go back and do it again and then if I keep struggling I set a goal to get before I leave the gym, like “I have to make five shots from this” or three in a row or whatever, so I do that before I actually take off, and so I would say I spend a majority of time on my weaknesses.*

When asked how much she practices her weaknesses, P6 said:

*I’d say probably... 75% of the time I’m out there just ’cause at this level, there’s not much more you can perfect. So you just have to work on the things you can, so I try and work on [my left foot] as much as possible because it’s definitely one of my bigger weaknesses.*

Still, the possibility of making mistakes can initially deter athletes from committing to practice. P6 continued:

*Working on what you’re bad at is hard because you can get frustrated, you can get down on yourself. But it’s something you need to do. So I think it’s really good to go outside of your comfort zone until it becomes a lot more comfortable and you don’t regret it at all.*

P2 noted the importance of working on both weaknesses and strengths:

*I think it’s really important to do both. I think your strengths are probably what get you on the court, so if you have a certain strength, [it] is what gets you on the court in the first place, but picking up your weaknesses and doing those is what’s going to keep you on the court. If Coach puts you in and you can only do one specific thing, it makes you one dimensional, but if you can work on your weaknesses and build those up, then...you’re going to help the team out a lot more and stay on the court... If you can only do one thing really well, that’s good for you, but there’s going to be certain games when you can’t really rely on that one thing, so you’re going to need other things to fall back on.*

Simulating Competition
Consistent with literature on contextual interference (Porter & Magill, 2010), training form activity (Ford et al., 2010; Partington & Cushion, 2011) and Play Practice (Launder & Piltz, 2006), participants frequently simulated the competitive situations in which they have to perform the skills they practice. P6 discussed practicing reacting to other players:

*If I’m aiming for a target, like having them moving into different spots so I have to see and react to what they’re doing because that always happens in a game. You don’t just have someone standing there.*

She also said she prepares for weather:

*Even different weather, I’ll go out and practice in the rain. We play in the rain all the time, so it’s good to know what differences there are... Definitely in games, it’s a big difference when it’s raining. The ball skips a lot more, so controlling it is a whole different story. So if it’s raining, and I have someone who’s willing to go out in the rain, even do long balls back and forth and try to control it while it’s skipping towards you, perfecting your touches in that.*

P1 said:

*If you have someone who can pass it to you wherever you are, that’s when I do a lot more game-like situations where you’ll set your man up, bring him down, come off to make it like you’re coming off a screen. Or sometimes from the five spots [baseline, wing, top, then the other wing and baseline], instead of just doing set spots, I’ll take a dribble, pull up, and shoot, just because that’s more realistic than just catching and shooting.*

When P1 does not have a partner, he envisions the circumstances of the game in which he would be executing the skill he is practicing:

*I try to envision in my head game-like situations or certain plays that we have or sets, where it puts me in a position where I have to imagine where the defense would be and make a move accordingly... I would bring my guy down and when I come off an imaginary ball screen, I would envision the guy showing for help side and I just make a move accordingly—try to split him or make a move to get around him. Game-like moves rather than just stationary stuff.*

This envisioning represents preparation for the perceptual-cognitive demands of basketball:
It has to be a spur of the moment...like you see something and you react, so you do the move. So I think by envisioning a defense or a guy helping off the ball screen, reacting, then doing the move makes it a lot more realistic.

While P1’s envisioning suggests the ability to simulate game situations while practicing alone, there seemed to be individual differences in this ability or the belief in this ability. For P3, it is more limited:

If you get the ball, you can practice a right hook shot all day long, but when it comes to game time, depending on how the defender is—if they can jump, if they can block your shot, if they’re more of a physical player—it’s going to change how hard you have to shoot it, where you have to put the ball, where you have to put your body, so I think you can practice the shot as much as you want, but when it comes to game time, it’s going to come down to where they’re actually playing you and what you can actually do at that point in time.

P7 felt the same could apply to field hockey:

But it’s hard to when it’s just me because it’s not going to be very realistic if I’m shooting on goal with no one around me. So I try to the best I can [to simulate competition], and I’ll do everything at game speed, like taking a hit fast and sprinting and that kind of stuff, but I wouldn’t say it’s as realistic as it could be or effective as it could be because it’s not very game-like, whereas there’s never going to be no one around me when I’m taking a shot on goal or something like that.

Sources of Content

Participants seemed to decide what and how to practice primarily from a) coaches and b) their own ideas.

**Coaches.** Current and past coaches were the main sources of practice content. Much content was directly prescribed by current coaches, and this process is consistent with Ericsson et al.’s (1993) observation that “the teacher designs practice activities that the individual can engage in between meetings with the teacher” (p. 368). For example, P2 said:

Knowing if Coach said “I want you to work on your deep threes and increasing your range,” then I know that’s something I’m probably going to almost every time I go into the gym, so I mean Coach helps set those goals and what you need to improve on, so not just doing threes but deep threes also...I guess how I figure out my goals is...I mean, we
meet with Coach at the end of the season. She'll tell us “This is what I think you should work on,” so hearing from other people what I should work on is helpful.

P5 said:

*This summer anyway during the off-season, our coaches give us a binder of just general things of “Here’s things to do,” so I would pick two or three or four drills from that, and then I would do kind of my own thing.*

In addition to direct prescription, some also apply what they have learned during team practice to their individual practice:

*What I’ve taken from my coaches in the regular season. I try and use that information in the offseason to work out by myself and determine what needs more work than other stuff.*

(P6)

P4 determined which skills to practice based on feedback:

*A lot of feedback that I get to work on is my skating and my hands and my shots, so that’s...stuff I try to work on there. It’s the three biggest things, so when I get a chance, that’s the primary stuff I’ll work on.*

He added:

*I don’t really create drills myself, but drills that I’ve been given in the off-season, sometimes I’ll incorporate those...I wouldn’t say anything special about them. Just being able to choose which drills you like from the off-season and incorporating those ones, drills you feel will help you the most.*

**Own ideas.** While this paper opened with the story of Bill Bradley’s innovative ways of practicing, most participants said they do not create any of the drills they do. However, an exception was P9:

*Most of the time I remember specific things—that’s also how I come up sometimes with new things I should do, like what we did in practice or like a game maybe where I did something wrong and I know I should have done it differently. And I try to come up with some kind of skill or movement that could have saved that ball, so I replay scenes from other practices or games.*

She gave an example of a drill she created for herself:

*One would be since I have a tendency when I go out and I come back in the goal, I’m off in my alignment with the goal or I don’t really know where the goal is behind me, so I*
have some kind of drills where I run around cones or whatever they have and I just go far up to the center of the circle or far up to the edge of the circle and then kind of backpedal or shuffle back just to see where I would be in the goal and just try to always be in line with where the ball would be. And if I have other people with me, they would stand or just throw a ball, or they would stay standing and I would run back to see if I’m still aligned with them. That’s one of the biggest things for me now.

The question of whether athletes develop their own drills merits attention because deliberate practice should target specific needs of an individual just as P9’s practice does. The lack of innovation by most participants could indicate a reliance on coaches and reluctance to consider new ways of practicing that target their specific needs and, therefore, lead to more improvement. This is not to say that common drills or drills taught by coaches are necessarily less effective than one that an athlete invents. Moreover, the source of practice content would not directly impact the effectiveness of practice—a well-designed drill is a well-designed drill, whether the athlete or the coach designed it. Nevertheless, athletes also might limit their improvement if they do not practice in their “learning zone” or identify how to refine specific aspects of their skills. While musicians and some individual-sport athletes may spend much of their training working one-on-one with their coach or teacher, team-sport athletes may not receive as much attention from their coaches. For example, their coaches may focus on team concepts in organized practices and provide little feedback during the off-season, so athletes themselves may be most familiar with their needs and in the best position to decide how to improve them.

**Deliberate Play**

Deliberate play (Côté et al., 2003) is playing informal games of one’s sport. While deliberate practice is closely monitored and done to improve performance, deliberate play is enjoyable and less structured. Participants reported several advantages deliberate play has over drills in practice. P2 said:

*I think this past summer I played more pick-up than I ever have before, and...So that really helped a lot, playing pickup, and getting in the habit of constantly moving and finishing no matter what and even if it’s just pick-up, you still have to play defense and play just like you would if it was practice. So just getting in the habit of that and running the floor, even if it’s just pickup, doing things like that definitely helped to apply all the*
things...because I can get up all the shots up that I want by myself, but...if I’m not playing, then it doesn’t really matter...I can make them on my own with no defense, but can I make them in a game or when I’m tired in the game after I just played defense?

P3 described how playing pick-up games with teammates during the off-season helps players understand the perspective of other positions:

Sometimes we have our guards guarding our forwards, our forwards guarding our guards. It’s like you just see what that person goes through, like “Oh, that’s why she never gets a pass down there” because of how the defense is playing down there.

While deliberate practice can be frustrating and difficult to complete, deliberate play is fun:

You practice on your own, it’s good after a while, but you need some variation just to remind you of why you play the sport, why it’s fun. Yes, practicing by myself is not the most fun, so when I got to play against my brothers or my boyfriend, it just reminded me of how fun it is. It brought out that competitiveness in me, I guess, just because I don’t want to lose to my brother. (P5)

P5 also explained that playing against males tests the effectiveness of her practice:

It was a way for me to see that what I was working on did carry over. You know, knowing the fact that I can do it against boys boosted my confidence where I know if I can do it against them, I know I can do it against girls. So for me, it was definitely a confidence booster and just good to see that what I had been working on is carrying over—it’s not pointless or worthless. My time was well spent.

She added:

Playing with boys is always a big step for me just because, you know, I knew they were better and I didn’t like the fact that they were better, so, you know what I’m saying? I didn’t wanna show them that they were better than me. I guess that was probably the most challenging because other than that, I mean, you can only push yourself so much. You know, you have to play against someone better to see where you’re at, so they were probably the most challenging for me.

P8 discussed playing pick-up games with teammates before the season starts to become accustomed to playing again after time off in the summer. When asked if the games had a specific purpose, she said, “Not really. I think it’s just to play around, to be able to pick up our sticks again and be able to play with our teammates and stuff that we know we’re going to be
able to do.” She indicated that games are less serious than practice: “But I don’t think there is a need to make [pick-up games] as serious a practice as it would with our coach being there.” Although these games are not specifically designed for improvement, she said they do improve players’ creativity:

*I think it takes more pressure off of it knowing that it is just our teammates and that it doesn’t matter if you mess up. Not that in practice it doesn’t matter, but there’s a lot less pressure as it would be if let’s say our coach there…so I think it makes us a little more creative, being able to try moves we wouldn’t be able to do before or something like that, so I think that’s the reason we just kind of play around, make it less serious…Like I said, I think the creativeness comes out when you’re playing a pick-up game. I think…when we scrimmage, say at practice…like a regular practice, if we’re scrimmaging against ourselves we try to make it as game-like as possible so we have that pressure and we know that mentality, and I think that changes. So if you haven’t mastered a skill yet, it’s kind of hard to try to practice that in a scrimmage when you’re trying to perfect that and make it game-like, so a pick-up game is kind of different and so you would…I feel like it brings a lot more creativity or things that you would try that you wouldn’t in a regular game, and I think that just brings on new moves that you might want to perfect later on.*

In addition, P9 supported Côté et al.’s (2003) finding that playing other sports can translate to an athlete’s primary sport:

*To practice regular reaction time I also do other sports too, like soccer or volleyball, badminton, just because I have to be able to see balls from every angle…Goalkeeper stuff in field hockey has a lot to do with kicking, a lot has to do with leg work, so soccer is great for that. So I play a lot with intramural teams, indoor or outdoor—it doesn’t even matter. It’s a lot of basic skills like kicking back and forth, even to myself or kicking against a wall or kicking to other people. And then…volleyball is more hand-oriented, right? It doesn’t even matter the size of the ball. I’m obviously used to small field hockey balls, but even playing with bigger ones, it still gives you feeling for the ball and how it’s going to move at whatever angle, so…*

She also discussed playing tennis but with her field hockey stick:

*I had one coach who told me tennis would be really good for me to play because the ball’s the same size and also I could even play tennis with my field hockey stick, so I did*
that too, which looks weird, but the other person on the other side would probably just play normal tennis, and I would hit with just my stick. So it’s harder because the stick obviously does not have this big…the surface of the stick is smaller, so that definitely helped…at one point I was really weak at using my stick at all and I was…intimidated or would not use it when I had to, so the tennis thing really helped.

**Practice Structure**

Practice structure refers to how practice is set up and organized. Deliberate practice is highly structured so that the performer maximizes improvement. Four sub-themes that participants discussed were: a) planning of content, b) repetition, c) monitoring of performance, and d) goal-setting for each practice session.

**Planning of Content**

Given the highly-structured nature of deliberate practice, it seems important for athletes to know in advance what they will do to practice if it is intended to achieve specific improvements in skill. Most participants tended to have a general idea of what they would practice but did not specifically plan the content before starting. P1 said, “I’ll have…in the back of my mind a focus on what the workout would consist of, but I don’t write off a plan before I go.” P2 said:

*I wouldn’t say that I have like a set plan, like I’m going to do this drill and this drill. It’s more like, “I’m kind of tired now” and I’ll shoot some free throws and then do 15 more threes or something like that, so it’ll just kind of go as it comes.*

P5 described her summer workouts:

*Depending on if I was tired or not, I would do probably some of the conditioning drills. And then if I didn’t do conditioning drills, I would usually scrimmage against my friend, whether that be me just on offense all the time, working on ballhandling moves or attacking the basket, or it was me on defense working on foot speed, that sort of thing. I usually have a general idea. I wouldn’t say I plan it out, like “I’m going to do this, I’m going to do this” for a time limit... So I guess in a sense I kind of had a general idea that I would always shoot and always ballhandle, but then after that it was just kind of dependent on if I felt good or if I felt kind of tired.*

P9 also did not plan in advance:
It’s not really exactly planned what I’m going to do. Sometimes…it basically comes to me...if something comes up in practice that I want to work on, like a new skill that I get introduced to, then I obviously do that. But if it’s like a normal week and there’s no new thing per se, then I’m just doing whatever comes to my mind.

Choosing what to practice according to how athletes feel distinguished individual practice from team practice in which they must follow the detailed plans of coaches. This freedom and flexibility seemed to encourage individual practice because it provided athletes with an alternative experience of their sport: while the structure and pressure of team practice and competition dictate what athletes must do, individual practice allows athletes to practice a skill when they want and feel ready to do so. It also suggests that not all practice is intended to maximize improvement, for some practice is meant simply to maintain skills. As P3 said:

So there are days I will come in and it’s just one of those things that’s not like I necessarily come in here to get the most out of it, but at the same time I need to loosen up, I need to stay loose, so that come tomorrow or come practice in two days, I’ll be able to be more efficient.

Still, some of these athletes did acknowledge that planning content ahead of time would benefit their practice. When asked to describe the qualities of a good practice, P4 replied:

I think just having it set up before, know what you want to work on. If you’re going out there and don’t really have a plan, you’re just maybe shooting some pucks but not really doing anything to make you better, where before I think if you take a little bit of time to think about what you want to do...

He added:

Some other days are just...you need a break time or just want to goof around a bit, but then the days when before I think about what I want to do and have a plan set out, that’s the days when I get the most out of it.

P2 said planning practice would promote more effective use of her time:

What I could do better is having a more structured practice, so I use my time more efficiently because sometimes I might not have an hour and a half to spend in the gym. I might only have 30 minutes, and if I don’t really know the drills that I’m going to do before I get there, then it’s just kinda like “Oh, maybe I’ll do this drill next, and I can work on this and this drill,” so I think effectively using my time would be something that
would help me feel really productive in my workouts because if you know what you’re going to do you can get more drills in, instead of sitting there having to think about what you’re going to do next.

P2 and P4 understood the difference having a plan can have on the quality of practice. They seemed to recognize that how much they gain from practice depends on their focus and use of time and that they did have the ability to determine that gain. Because they were aware that they tended not to plan practice, this habit seemed to be by choice, rather than out of ignorance of the benefits of planning. Partington and Cushion’s (2011) study on team practices found that coaches had their teams spend the majority of practice in “training form” activity despite agreeing that “playing form” activity would be more effective. The researchers attributed this cognitive dissonance to the coaches’ lack of understanding of how to implement “training form” activity. In the current study, the discrepancy between neglecting planning and believing in planning might be attributed to a lack of understanding of how to develop a habit of planning.

Repetition

Repetition of a skill has been considered a key component of practice. The monotonic relationship between practice and performance (Ericsson et al., 1993) implies the need to practice a skill repeatedly both over time and within a single session of practice. P7 explained the role of repetition when practicing hitting in field hockey:

*Just with the stack of balls next to the goal, and I’ll just set up, and one after the other, just a lot of repetitions. I’ll do a hundred reps of that, and over time, your muscle memory—it’ll help.*

P8 said practicing her aerial flick involves “basically just repetition”:

*I think that’s a really big key to any sport when you’re trying to master something, like a new skill or a new move. It’s just repetition, and trying to get it over and over again so it just becomes second nature. So I would just have my coach correct me on things I’m doing wrong or how to do it or make it better and just kind of practice it as much as I could to get better.*

Repetition alone, however, may not be sufficient for improvement. Repetition leads to habit, and for that habit to be one of proper execution requires performers to generate feedback by monitoring performance and making adjustments to their execution according to that feedback.
**Monitoring Performance**

According to Ericsson et al. (1993), deliberate practice involves close monitoring of performance. Ideally, this monitoring is done by a teacher who can identify errors and provide constructive feedback, but experienced performers can learn to monitor themselves on their own, as in individual practice (Ericsson, 2006). Five categories summarize participants’ methods for monitoring performance: a) systematic monitoring, b) monitoring by feeling, c) feedback from others, and d) effort.

**Systematic monitoring.** This category refers to planned methods of monitoring that generate specific information about how athletes performed and how they can improve. P6 said she tracks her progress in a notebook:

*I’ll keep track of my progress, like write stuff down: what I need to improve on, what number I’m at, how I need to get better and then just work from there, see what I need to get better at... It definitely gives me a goal to set. If I know I’m getting better, if I know I’m easily getting better, I know I should set the number higher, increase the difficulty of what I need to do.*

P9 said she videotapes herself practicing and then reviews the video:

*I try at least once a month to have friends video tape it, so I just see the improvement...we also sometimes videotaped my practice and goalie practice, so that’s when I thought, “Well, maybe if I videotape some of my reaction time skills when I do them at the [recreational center], that helps the same way.” And it helps to have it and look at it at different times and see what you did in the past and how it’s getting better.*

She discussed what she looks for on the video:

*A lot is core strength and movement...Videotape is easy because you can stop it and see how your body turned and stuff. Since I’ve played for so long, it’s not really about kicking the ball anymore. It’s more about how you kick the ball and how the ball is going. It’s about looking really specifically about how your leg moved or something.*

Although reviewing video was the most careful and systematic monitoring by the participants, it only provided feedback after completion of practice, which would preclude the athlete from processing and applying feedback to make adjustments within a practice. Most participants, however, did not report any systematic and consistent means of monitoring themselves at all. Instead, they seemed to rely on feeling, feedback from others, and effort.
Monitoring by feeling. Several athletes gauged their performance based on intuitive feeling. P2 said she monitors “just by how I feel” and “If I don’t feel tired any more. Or after I’ve done that drill previous times on my own and I feel that drill gets easier or I’m getting better at it, that’s just another way.” P6 also said, “And just knowing that I’m getting better. I can feel it when I’m having a good day.” P4 did not seem to have thought about monitoring his performance:

You can just get the feel for it yourself and watching others do it too. To see them doing it, maybe you can compare yourself to others as well, I’d say, and just to your norms. I’d say that’s how you’d probably do it.

Feedback from others. Participants also valued feedback from teammates and others for indicating progress in practice. In contrast to the feedback on how to improve further that an athlete would receive from a coach in deliberate practice, this feedback tended to be evaluative:

Another indicator is the person I’m with who’s there with me, they say “nice move” or “Oh my gosh, I can tell you’ve gotten better at that.” Because my dad, he was usually there most of the time, and he’d be like “You know, finally you got the move down” or something like that, so I think that was another indicator of a good practice or improvement. (P5)

Similarly, P6 added, “If I’m working with someone, and they tell me ‘Oh, you did really well,’ it just feels really good to hear.”

Effort. Some participants measured their progress according to their effort. P5 said:

If I’m in there and I know that I’m pushing myself, I’m working really hard, like I’m sweating a lot, the person who’s rebounding for me…they’re kind of giving me energy, then I know I’m getting something out of it, I guess.

She also said, “I felt just being there I was improving in some way. I didn’t want to waste my time I guess.” Similarly, P8 suggested that effort translates into improvement:

Your mindset going into practice—if you know you’re going to work 100 percent, give 100 percent, like go to every ball and you feel you left nothing out at practice—then you know you’re going to get better.

Effort is a defining characteristic of deliberate practice, which can be sustained for only so long each day because the effort it demands exhausts the performer (Ericsson et al., 1993). Although effort has a critical role in deliberate practice, this role is distinct form the role closely
monitoring performance. Improvement of skills in practice certainly requires effort, but to assume that great effort necessarily indicates improvement is misguided. Similar to repetition, effort is only one element of the process of improvement, so it alone cannot be seen as a measure of the outcome of that process.

**Goal-setting**

Research has provided significant evidence that goal-setting enhances athletic performance. According to Locke and Latham (2002), goals help athletes direct their attention to relevant tasks, increase effort and persistence, and encourage new learning strategies to accomplish their goals. Effective goal-setting is a systematic process that involves setting outcome, performance, and process goals. Goals should be specific and measurable and should challenge the athlete, just as a task in his or her “learning zone” does. While coaches and athletes commonly set goals for the season or an upcoming competition, Gould (2010) has recommended they set goals for practice too. Participants in the current study did report setting goals while practicing certain skills:

> I’ll play games with myself...on the [shooting] gun. I’ll do five spots—like baseline, wing, top, then the other wing and baseline—and I’ll shoot 20 or 30 from each spot, and I’ll try to make 17 or 18 out of 20. And if I don’t, then I’ll start over from that spot. So I just try to make goals like that, play games like that against myself, try to stay competitive. (P1)

P2 said she sets goals when shooting to make sure she benefits from practice:

> Just by making sure that I’m going hard, focusing on every drill. It’s not just like “Oh, I’m just going to shoot 10 shots here.” I’m going to try to make the shots and make 8 out of 10 instead of just shoot 10 shots. So...setting mini goals in drills and then just...setting up specific drills that are game-like.

These process goals seemed to be a strategy for breaking up the monotony of practice and encourage persistence. P1 said goal-setting, “makes a workout, like if you’ve had a long day or something, it’ll make the workout by yourself just go by a lot smoother...if you’re battling with your mind.” P9 added:

> I really try to either set little goals—not like a big goal for the whole day—but like “in the next five minutes I’m going to get so many times against the wall” and make little steps so it keeps you going...If you just set little goals, you get a little break after a while, that keeps you going and get the most out of it.
The extent of participants’ goal-setting tended to be limited to these process goals. Some participants focused on a certain quantity of practice without setting a goal:

*I don’t know that I set goals. Really the biggest thing was probably I try to get up a certain number of shots, so I guess that could sort of be a goal. I usually tried to get close to 500 shots every time I went in, whether that would be free throws or shooting around the arc. But I guess that would be my real, only goal. Other than that it would just be doing something to get better, you know?* (P5)

*Like for juggling, for example, I’ll have a certain number to go to, try and get that, and then I won’t stop ‘til I do... I try to use just my right side of the body, so like your right thigh, right foot, and then I set a number and once I hit that number, I’ll just keep going higher and higher until I reach my limit and just keep going.* (P6)

Orlick and Partington (1988) found that Olympic medalists set clear daily goals for each practice. In contrast, college athletes in the current study did not consider setting goals for what they wanted to accomplish by the end of each practice. When asked if he set goals, P4 said, “Actually, not usually, no. Unless you’re doing a shooting competition with somebody. I’ve never really thought about that [when practicing individually]. Not really.” P7 also had only a general idea of what tasks she would practice:

*No. I wouldn’t say that I do [set goals]. I mean, I just kind of go and do it and do what I want to do. That’s kind of the beauty of an individual [practice]. I can just kind of stop when I want, do what I need to work on, so...I would say I have a goal of “I want my hit to get better” but I don’t have a goal of “Ok, I’m going to do these hundred balls, and then I’m done.” So I would say I have more of a long-term goal—not so much of an individual practice to individual practice goal.*

P1 explained that the lack of a plan makes goal-setting difficult:

*If I were to plan a practice, I might set more specific goals. But the fact that I don’t and the fact that it’s much more loosely based off of how I’m feeling and stuff I want to do, I think it would be tough to set goals. I mean, as I go, I think about stuff like...I don’t want to miss more than five shots or something like that, but nothing...really specific.*

This last insight from P1 encapsulates the connection between some of the themes discussed so far. Goal-setting may be a useful tool for optimizing the effectiveness of practice,
but participants’ failure to plan practice content would undermine their ability to set goals. In addition, the lack of motivation that was identified as a barrier to practice supports the need for goal-setting since goal-setting can increase motivation.

Quality of Practice

While the effectiveness of practice depends in part on performing appropriate drills, it also depends on the quality of practice, or how athletes perform those drills. Participants reported engaging in high quality practice but also acknowledged instances of low quality practice.

High Quality Practice

Participants maintained the quality of their practice in three ways: a) practicing at game speed, b) engaging in purposeful practice, and c) pushing themselves.

Game speed. The time an athlete has to execute a given skill is limited in open-skill sports because of constantly changing conditions, such as the behavior and positioning of opponents. P1 explained how practicing a skill at the same speed required in a game is important for high quality practice:

*Just focus on it being game speed. You see kids shooting around or getting shots up or whatever, but that really just consists of them shooting, walking, getting their rebound, shooting again. There’s no time in a game when you’re going to have that much leisure, so the main thing is really just focusing on the game speed. Like if you’re focusing on getting your shot up that much quicker or keeping your dribble that much lower, it really translates and makes practice effective, rather than just killing time.*

He added that this speed, rather than the originality of drills, is the defining characteristic of his practice:

*I wouldn’t say that the things that I do are out of the ordinary. I’m sure a lot of people do similar drills. I would just say that I’m proud of the fact that I go at a certain speed that helps me really progress rather than just maintain.*

A technique he uses to ensure he practices at game speed is to set a timer while he shoots:

*If I’m doing ball screen stuff and it’s somewhat tiring, I’ll set a timer and gotta make a certain amount in a certain amount of time. So I’ll go do the move, pull up for a jump shot, then I gotta get the rebound quickly and go back and do it again. Just to make it game speed. You feel like you’re moving quickly and gotta make a quick decision.*
Practice does not necessarily lead to improvement if it is not at game speed. He explained, “I’ve adapted the idea that you practice how you play. So if you’re practicing stuff at a slow speed, that’s not real game realistic, so you’re not necessarily getting any better.”

P7 also emphasized practicing at game speed: “I’ll do everything at game speed, like taking a hit fast and sprinting and that kind of stuff.” However, she admitted that maintaining that speed can be a challenge when practicing alone:

*It’s definitely different from a team practice because there’s not a coach there watching you. I try to keep it as fast paced, as realistic as if someone was there. So...I try to do things quickly and I’m giving 100% effort.*

**Purposeful practice.** While participants did not set specific goals for practice, they did have the purpose of improving the skills that they practiced. They recognized that the effort, concentration, and execution required to achieve this purpose is distinct from simply “going through the motions.” P2 said:

*Sometimes I end up going to the gym and feel like I don’t really get anything out of [practice], but I don’t really like doing that ‘cause I feel like you wasted your time. So if I’m going to be in the gym I want to feel like I got something out of it and can actually apply it when I’m on the court.*

She achieves this purpose by:

*Making sure every drill is effective and not just done just to complete it. Like to actually do it to get better, not to do it just to be in the gym. That’s the kind of mindset I usually need to have.*

She also discussed the importance of sensing improvement:

*I feel like when I get the most out of practice I leave feeling like I got better...I never want to feel like I got worse or just came just to be in the gym. I feel better about how my shot feels, or I feel better about finishing or whatever it is I’m working on. Like I felt like I got better at it. That’s what makes me feel good about practice.*

P3 discussed learning to be more efficient at practicing:

*You can do less repetitions and sets but make sure that they’re more effective and efficient. So in high school, if I was doing something with my left hand, I might do it five times in a row, whereas in college I can do it two or three times and make sure they’re good solid ones.*
For P5, purposeful practice involves thinking about how she would read the situation she would face in a game:

> When I go against the chair, I always think “Okay, she’s overplaying me to the left, so I can crossover to my right.” ...I have mental things in my head that I keep in mind as I’m doing moves, like I don’t just go through the motions. I make sure I’m doing them for a purpose.

**Pushing self.** Since practice can be tiring and frustrating, a key to maintaining high quality practice was the ability to push one’s self to continue. P1 said obstacles to persistence include “just fatigue, or just the idea if you’re frustrated with your shot or how it feels.” He added:

> I know when I’m pushing myself and when I’m not, just because I’ve been practicing by myself for so long. You know...your limits. So...sometimes I’ll find myself not going my hardest when I still have a lot left in the tank, and those are the times when you just got to focus in when you’re by yourself and just tell yourself that you’re kinda B.S.-ing and need to turn it up.

P5 said:

> So it’s like I can go through the motions, but that’s practicing bad habits, and I don’t want to be practicing bad habits because in the game I'll do the same thing, and it won’t be productive. So it’s like I want to make sure I’m doing my part for the team and I know that in order to do that I need to push myself.

She noted how much better she feels after pushing herself:

> When you push yourself to a certain point and you reach that point, and you’re just so proud of yourself, that’s really big to me. Whereas some days I’ll leave the gym knowing I should have done one more sprint, I know I could have done it. You know what I’m saying? Kind of regretting that I didn’t do something a little extra. But the days that I did that little something extra, and I made it, and I proved to myself that I could do it. Like I said, it boosts my confidence or makes me feel like I got something out of what I did, so probably pushing myself or working a little harder than I did the last time, or putting up a few more shots than I did the last time or something like that.

P2 mentioned that practicing with someone else helps her hold herself to a high standard:
It also gives you someone to compare, like if I make 3 out of 5 and she makes 4 out of 5 shots, then I’m like “ok, I can make 4 out of 5 next time.” So...having someone there to push you and compare yourself to is helpful.

The participants seemed to feel responsible for pushing themselves. P1 explained pushing himself even after an exhausting team practice:

But you still have to kind of keep in mind that you want to go at a decent speed. I mean it might not be your top speed but just keep in mind that you’re not wasting time in the gym.
You know whether you push yourself or you don’t, so you just gotta hold yourself accountable.

Similarly, P7 said:

I think [getting most out of practice] means holding yourself accountable and playing like you were...if the coach was standing and watching, so not just nonchalant walking around, being very non-realistic, not giving it your 100 percent effort, not playing like you would in team practice or a game or something. Just giving 100 percent effort and not giving up.

She added:

We talk about it a lot as a team, that even though it is an individual practice and it’s not...supervised, I think that you have to always know...what your potential is. So...if I know I can go faster, you need to push yourself to do that, you need to push yourself to be the best if you know that you can do that. You can’t sell yourself short and just kind of practice...half-ass because you know you can do better than that. So you just kind of have to know that and hold yourself accountable to that standard.

When asked what it takes to push herself, she said, “I think you have to be mentally strong, and some people are better at it than others, so you just have to tell yourself, ‘I’m just going to get through this and I’ll be done.’”

Mindset. Before some athletes can get to the point where they have to push themselves, they need to enter practice with a mindset that they want to exert the effort to improve. P5 described how her attitude affected her quality of practice:

I think a lot of it has to do with my attitude as well ‘cause some days I’d just be having a bad day and I’d try to do things, and it wasn’t very productive. I’d be slow, going through the motions, so I knew I didn’t really get better. But then some days I’d come in
ready to go, high energy, in a good mood ready to get better, then I knew that I was improving or that I was working on some aspect of my game that needed work done.

P6 said:

I think it’s just all about mindset, personally. Like if you don’t have the right mindset, you’re not going to go out and do it, and you’re not going to be able to get better. So I think it’s just a lot mental, a lot of the mental aspect in there. It’s not just the physical part…once you get out there, you have to be willing to try and get better. Not just do what you’re comfortable with, like stepping outside your comfort zone… Doing everything you can to get better.

Low Quality Practice

Athletes recognized the importance of high quality practice, but they acknowledged times when their practice is of lower quality. P1 said:

There are certain days I’ll go down and I’ll say I’m going to be there for a certain amount of time, and then when I’m done, I just don’t necessarily feel like I accomplished very much because I’m tired or for any other reason my mind is elsewhere. Sometimes you just have a bad day, so…I would say I could work on minimizing those days.

P5 would stop practicing when she recognized she was “going through the motions”:

I think a lot of it had to do with I’m in a bad mood…I’m not making a lot of shots, it’s really frustrating. I feel like I have a good release, it’s not going in. I’m just like “Ok, I just have to leave. I’m tired. I’m not in the mood to do this.” That’s a good indicator for me—if I’m not in a good mood, I’m already getting frustrated and I just started—something like that, that’s definitely a big indicator. I mean, I can tell when I’m at my best or kind of just going slow, so when I realize I’m going slow through drills or it’s not quite as good as the last practice I had, I’ll just be like “Ok, maybe I’m tired. Maybe weights is affecting me. Maybe something else I did earlier is affecting me. I’ll just come back on another day.”

For P6, practicing alone can reduce the intensity of practice:

I don’t think it’s as effective as it could be just because it’s on my own time, so I just kind of take it slow, do my own thing. It’s not like an intense practice like I would with the team…but I do my best to keep it going. I can set my own water breaks, I can take breaks when I need to, so it’s not that intense.
These instances of low quality practice raise the question of what athletes can do to minimize their occurrence. Ericsson et al. (1993) have pointed out that an advantage of practicing alone is that the timing and duration is flexible since individuals do not have to depend on the availability of coaches or teammates. Thus, if athletes can choose when they practice, it seems they could choose times when they are physically and mentally ready to engage in high quality practice or take the time to mentally prepare themselves to practice effectively.

**Psychological Experience**

This theme describes the affect and cognitions of participants during and immediately after individual practice. Participants were asked about how much they enjoy practice, how they would characterize their attitude toward practice, and what they think about during practice. Responses suggested five common experiences: a) stress relief, b) positive affect, c) negative affect, d) confidence, and e) thoughts during practice.

**Stress Relief**

Several participants felt that individual practice relieves stress. This effect seemed to stem from enjoyment of their sport combined with the solitude of practice.

*It’s my time to unwind almost. Like if I’m stressed with school, stressed with a girl, or something like that...when I’m in the gym, it’s just me and myself, I can kinda clear my mind, sweat everything out a little bit. And even if it’s stress from basketball too, like if Coach is really riding me or something like that. Sometimes that wears on you as an athlete, and I think if you can get in the gym, it puts things back in perspective—you know you’re blessed to be there. It helps you zero in on what you want.* (P1)

*For me, basketball’s kind of a stress reliever...It allows me to be by myself, and...just having a ball in your hands and just doing something you enjoy just relaxes you even though it can be frustrating at times. I just don’t think I can put it into words. It is what it is—something I enjoy, something that I love to do.* (P5)

*I think [individual practice is], for me at least, kind of therapeutic. It’s just kind of my time—I can think just about field hockey, by myself. So it’s like...how artists feel when they go draw by themselves or something like that. It’s calming.* (P7)

**Positive Affect**
Individual practice fostered positive affect in the participants, who discussed feeling accomplished and good about themselves for practicing.

*If you shoot the ball extremely well, you go out of the gym feeling good. But I think anytime you’re in the gym, there’s a lot of people who aren’t in the gym, and if you keep that perspective and you’re working hard while you’re there, I think you always feel accomplished when you’re done.* (P1)

*Feeling like you accomplished something, knowing that you did work, you’re not just slacking off...I want to be tired, sweating, knowing I did something. And I want to get better, obviously. I want to do better than I did last time and set goals for the next time as well.* (P6)

*A lot of times I’m not motivated and would rather be doing other things, but once I get out there, it’s fine. The hard thing is just getting there, and then once I’m there, I’m like, “Oh, this isn’t bad. This is fun, I’m getting better.” And then I feel really good about myself afterwards, so it’s worth it.* (P6)

*Then other days, when you’re able to perform a skill right all of the sudden, like you weren’t able to do it in practice with the team but now you practice so much on your own you’re able to finally do it, that’s like what I guess are the good moments and then you see that it’s worth it, so you do it again.* (P9)

P3 talked about enjoying the process of practicing: “I love it. Absolutely love it. It kind of goes back to...you’re doing it for you. It’s the self-motivation, it’s the self-confidence boost type of the thing.” She added:

*You can be there anywhere from 2 to 4 hours in a given day. You don’t even realize it half the time because it’s on your own, it’s what you want to be doing, and yet you’re getting that much better...*

This positive affect supports findings by Helsen et al. (1998) and Hodge and Deakin (1998) that athletes find the activities most relevant to their performance are the most enjoyable. Some enjoyment seems necessary to sustain a regular habit of individual practice since it is a voluntary choice. Furthermore, because the participants described enjoying practicing on their
own, they seemed to derive enjoyment from practice itself and the prospects of improvement, rather than a social component that can be present during team practices.

Confidence

A prominent finding was that practice builds confidence. P3 said, “I think the thing that [practice] affects the most is your confidence. I think it shows in your demeanor, it shows in your actions.” P1 explained how envisioning game situations during individual practice builds confidence:

For me it helps with my confidence more than anything. It helps me be confident in myself to do certain moves that I may not…I wouldn’t be comfortable with if I hadn’t practiced it a lot.

P2 said:

I think practicing alone is also a confidence booster for a lot of people. If you know that you’ve been in the gym shooting such and such amount of shots every day, then you know in the game you should be able to hit that, but if you feel like you haven’t been in the gym for a while, and you go in [a game] and you’re not making your shots, then you’re just kind of like “Well, I haven’t really been shooting anyways, so…” So I think that’s definitely something that…it makes you more confident, you feel better about your game.

P5 discussed how individual practice can provide a needed boost of confidence in adjusting to college-level competition:

At the high school level, you know, you’re good in high school, but then you come to college and everyone’s good, so it’s like you had that confidence in high school, but coming here it’s like “Oh man, I’m not as good as everyone.” So I think a big thing for me is also the confidence piece—reminding myself there’s a reason I’m on this team, and there’s a reason why I was chosen to be point guard, so that goes through my mind a lot too when I’m playing.

She also explained that part of practice is learning to maintain confidence:

You’re just going to have those days when you don’t make anything but they can still be a good practice. I think good practice is also when you have a lot of confidence in yourself. You may not be developing your skills, like making a lot of shots, but as long as you’re learning to know it’s okay that you missed those shots, I guess is another indicator of a good practice, for me anyway.
Negative Affect

Although the participants generally said they enjoy practicing on their own, some did experience negative affect. P2 said, “Sometimes I think it’s boring to be in there by myself and shoot, so I like to shoot with someone else.” P9 added:

*It’s a day-to-day thing, like sometimes it gets, especially if I’m all by myself, it gets boring at some point and I think you get bored faster than you would at [team] practice because you don’t have other people around to motivate and coaches to look at you because obviously it’s fun to play for others too, like to let them see you so that’s something you miss when you practice by yourself.*

This boredom and lack of motivation supports the use of techniques such as goal-setting or self-talk to enhance persistence in practice. As discussed earlier in this section, some participants needed to enter practice with the proper mindset to have a high quality practice, and it seems possible that athletes could reduce any negative affect by establishing such a mindset. At the same time, the fact that these athletes continue to engage in individual practice despite boredom or lack of motivation further underscores its perceived value to the athletes’ performance.

Thoughts during Practice

Much of applied sport psychology has followed cognitive-behavioral theory, which emphasizes the relationship between thoughts and behavior, so it seemed important to examine how athletes think during practice. For example, P3 said she focuses on winning a championship:

*Personally, I think about [a championship] a lot. I don’t know if that’s a good thing or bad thing. I think it impacts the way I practice at certain points, like if I’m having an awful day or if I just can’t hit a shot or doing something wrong, then I’m like “What can I do right? What can I still do to work towards that championship?” rather than “Oh, it’s a horrible day, pity me.” It’s like instead...I’m still thinking about that ring, so how do I get to that ring?*

P6 also looked forward to next season while practicing:

*It’s definitely thinking about next season. Always striving towards getting better for my next year. Especially next year, my senior year I want to be the best I can do. It’s just all about getting better...and having fun doing it.*

In contrast, P9 talked about avoiding looking too far ahead and “not getting distracted”:
Don’t start thinking about your homework or your next practice. It’s more thinking back to old practices rather than thinking ahead because I’ve had that in the past where that distracts me, if I look too far, like “Next fall we’re going to have a [conference] championship again.”

She explained that her thoughts focus on her individual performance:

Yeah, I mean that’s more like what we do in practice already, right, that’s what we practice for, to go farther than this year. But the individual skill sessions are more for my own performance, I don’t look too much to where we’re going to go with the team.

While thoughts of a championship appear to be motivational, P5 shared how she thinks about the actual task she was practicing:

Let’s see…just that I know I’m the point guard and I know I have to take care of the ball, so when I’m going to this chair, I’m keeping that in mind, like “Take care of the ball. Don’t turn it over. Make sure you have the proper timing…take that extra step or take that extra dribble.” “Protect the ball” is a big one…“Don’t be afraid to shoot it. Have confidence in yourself,” that’s another big thing for me as well.

How or whether athletes should think during practice has not been studied extensively, but Holliday (2012) has proposed balancing a “training” mindset with a “trusting” mindset. A “training” mindset involves analyzing one’s technique and execution whereas a “trusting” mindset involves less analysis and more belief that one can and will perform. While a “training” mindset parallels close monitoring of deliberate practice, Holliday (2012) argued that athletes should practice at times with a “trusting” mindset since coaches often urge athletes to “trust” their abilities in competition. P5 was the only participant who reported specific and intentional thoughts that were not just motivational. Most did not seem to have considered how they should think during a drill. For example, P4 could not describe his thoughts because he was unaware of them.

**Autonomy**

Autonomy refers to independence from others and freedom to choose one’s actions, and it was a prominent part of athletes’ experience of individual practice. Individual practice provided the athletes two categories of autonomy: a) the ability to determine the content and structure of practice, and b) the feeling that they practiced for themselves.
Content and Structure. While coaches determine what players do in team practices, athletes are able to choose the content and structure of individual practice. P2 said she likes “having the time to do the drills I want to work on instead of the drills Coach thinks I should work on.” This freedom makes practice enjoyable for her: “I find it enjoyable especially if I get to pick the drills that I want to do…if I’m doing drills that I feel are beneficial to me and I feel productive after, then I really enjoy it.” P7 also liked being able to practice skills especially relevant to herself when practicing on her own:

*It allows you to work on something specifically that you want to. Like at a team practice, you might work on something that the team didn’t do well, like in the last game. But say you have one skill, like “I really need to work on pulling the ball right,” then you can do that and just focus on that and…you can kind of create your own schedule so you can do exactly what you want to do at your own pace, and I would say that’s the biggest pro to it.*

The ability to practice at their preferred pace appealed to some participants:

*I just kind of take it slow, do my own thing. It’s not like an intense practice like I would with the team, so…but I do my best to keep it going, but I can set my own water breaks, I can take breaks when I need to, so it’s not that intense.* (P6)

This pace keeps P6 from getting frustrated. She said, “It’s my own pace doing what I want to do to make myself better, so I don’t get frustrated that often.” The absence of a coach helps by relieving pressure: “There’s no pressure because I’m by myself, I’m just kind of working on my own pace. So I’m not having a coach on my back telling me ‘do this’ or ‘do that.’”

Practice for self. Athletes are often said to play “for” a coach, and participation at team practices is part of their responsibility to their team. The improvements from individual practice may also eventually benefit the team, but the participants generally felt they were practicing for themselves since they chose to engage in extra practice and focused on skills most relevant to their personal performance. P4 talked about proving his abilities to himself: “In our [team] practices, you’re proving yourself for the team. Whereas if you’re doing it on your own, you’re proving it for yourself, where you can more identify your weaknesses and improve those…” P9 reiterated that she thinks more about her own improvement than the team during individual practices, which are “for you personally since you know you want to achieve something for yourself and want to prove to yourself that you can learn a new skill.”
P3 pointed out that practicing alone allows her to generate her own feedback on her performance:

*It's definitely more of a mental thing than anything because when I'm in there by myself, I know I'm working for myself. I think a lot of time players get caught up in “Oh, so-and-so is watching me, so I have to do really well.” When you're in the gym by yourself, it's just you, you know if you make a mistake, you’re the only one who sees it, you’re the one who knows how to correct it...you’re getting feedback from yourself rather than outside feedback, which I think a lot of times people need because you need a mixture of both...at practice it’s nice to have feedback from coaches or teammates, but I think when it comes down to it, you kind of realize what you do a lot of the time, so for you to realize it and fix it yourself, it’s more of a confidence boost.*

That collegiate athletes are able to learn how to improve on their own is significant because it suggests they can trust themselves. Today’s emphasis on organized sports at the youth level and highly structured schedules at the collegiate level could potentially cultivate a dependency on coaches for instruction, so the chance to coach themselves in individual practices can remind athletes of the expertise they have accrued over several years of playing their sport.
CHAPTER FOUR: GENERAL DISCUSSION

The purpose of this study was to understand collegiate athletes’ experiences of individual practice. Practice warrants attention because it is what athletes can do to improve their performance. The theory of deliberate practice (Ericsson et al., 1993) explains that more practice leads to better performance and that the quality of practice is as important as the quantity, and recent studies (Ford et al., 2010; Partington & Cushion, 2011) have considered effective approaches to practice and athletes’ actual practice habits in team practices. The current study added to the literature by investigating individual practice, defined as practice done alone or with a limited number of partners outside of organized team practices. It also provided athletes’ lived experiences and perspectives on individual practice.

**Importance of Individual Practice**

Participants recognized and embraced the relationship between performance and practice. For several of them, work ethic appeared to be a source of pride. P5, for example, said that practicing “shows a lot about your character.” This embrace of practice is characteristic of a “growth mindset,” which includes beliefs that one’s abilities can be improved through effort (Dweck, 2006). This attitude contrasts with the “fixed mindset” that assumes abilities cannot be changed. A fixed mindset is responsible for the common belief in sports that high performance results from “natural talent.” A growth mindset seems necessary especially for a habit of individual practice since, unlike participating in mandatory team practices, engaging in individual practice is a choice. Even if athletes feel obligated to practice extra to avoid losing their role on the team (McCormick & McCormick, 2006), they would only agree to do so if they believed practice could produce the necessary improvements.

Individual practice has distinct advantages that complement team practices. It is a chance for athletes to work on individual skills that they do not work on in team practices, which usually focus more on team concepts. It also may be the best setting for improving those skills. Ericsson et al. (1993) found that practice alone was the activity that was most relevant to performance and distinguished the best violinists from inferior ones the most. When practicing alone, performers can concentrate. They are not subject to distractions from teammates or pressure from coaches, and they can perform more repetitions of a drill since they do not have to wait for others to take their turn. The biggest advantage of practicing alone is that athletes can focus on the skills they
need to practice most, so they can maximize repetitions of the tasks most relevant to their personal performance.

However, some ambiguity exists concerning which tasks are most relevant. In deliberate practice, “specific tasks are invented to overcome weaknesses” (Ericsson et al., 1993, p. 368), but the definition of a “weakness” is unclear despite having significant implications for determining practice content. A weakness could be a distinct skill that an athlete performs worse than other skills. For example, a good shooter in basketball might be weak at dribbling, so he would design “specific tasks” to improve his dribbling. On the other hand, a weakness could refer to a certain aspect of a skill, even if the athlete generally performs the skill well. The good shooter might be even better if he worked on having a quicker release or shooting off the dribble. In studying companies, Collins (2000) found the most successful ones followed the “hedgehog concept” by narrowing their efforts to becoming the best at what they could do best. In sports, perhaps athletes achieve their optimal performance by becoming the best (or very good) at what they do best. This question is important at the college level because of teams’ “win-now” mentalities and athletes’ limited years of eligibility. Youth athletes may have time to master strengths and develop new skills, such as post moves and outside shooting in basketball. But once athletes reach the college level, they have to allocate time to skills that will promote performance in the current or upcoming season, rather than long-term development.

**Practice Enhancement**

Although sport psychology interventions typically focus on performance enhancement, this study suggested there is a need and potential for practice enhancement. Deliberate practice is more than practicing the most appropriate skills. It requires structure and mental readiness to maximize improvement of those skills, but participants in this study admitted overlooking these components of practice at times.

Adequate preparation could enhance practice before athletes start practicing. Coaches and athletes, including one participant, use the phrase “practice how you play” to imply the need for full effort and drills that simulate competition in practice. To fulfill this mantra, it also seems necessary to “prepare to practice how you prepare to play.” Planning practice content before stepping on the field or court would likely lead to practicing the most relevant skills by performing the most effective drills. Without thinking about practice content first, athletes may resort to doing simply what is most familiar or easiest to do. Participants tended to have general
ideas of what they would practice, but some acknowledged they “get the most” out of well-planned practices and would use time more efficiently if they planned practice content.

Goal-setting could promote advanced planning. Knowing what they want to accomplish can guide athletes in crafting a schedule of drills that will help them the most. While mental training often emphasizes goal-setting for games and entire seasons, participants rarely set goals for individual practice, but the increased effort, persistence, and attention to relevant tasks that goal-setting promotes would likely enhance practice as well as performance in competition.

Close monitoring of practice is another key component of practice because it helps ensure that the habits developed in practice are habits of proper execution, yet it was absent from most participants’ individual practice. Monitoring generates feedback that performers can use to adjust their skill execution accordingly during practice. Without feedback, “mere repetition of an activity will not automatically lead to improvement” (Ericsson et al., 1993, p.367). However, participants tended to monitor their performance in practice only loosely. Some relied on effort to gauge the effectiveness of practice. If they felt they gave full effort, they felt they also improved. Effort may be necessary for improvement, but it is not sufficient. One can exert full effort performing a poorly designed drill or performing a skill incorrectly, but that practice would only lead to learning the skill incorrectly or being ill-prepared for competition.

Participants seemed to neglect close monitoring because they were uninformed, rather than misinformed, about how and why to monitor their practice. That is, they loosely monitored their practice not because they strongly believed that to be the best approach to practice but because they had not consciously considered how best to monitor practice in the first place. This is not to say that they were oblivious to their performance in practice, but they generally lacked any systematic method of monitoring as a routine part of their practice. Martin and Toogood (1997) implemented a self-monitoring intervention that helped figure skaters master skills more efficiently. To adhere to good practice habits, the skaters completed a checklist of those habits before practice, and they monitored progress on specific skills by rating their performance of those skills after each practice. Kirschenbaum, Owens, and O’Connor (1998) found using a simple scoring system on their scorecards helped golfers self-monitor their use of a mental skills training program during rounds of golf. While coaches are usually the ones who monitor performance in practice and provide feedback, these interventions provided ways for athletes to monitor themselves and notice how they can improve.
While the structure provided by planning and monitoring is a defining characteristic of deliberate practice, the “human” element in the quality of practice should not be forgotten. Participants acknowledged they would sometimes be on the court or field but not in the right “mood” to practice or were having “a bad day,” so it is important to help athletes realize that they can determine their readiness to practice. Mental training interventions could produce optimal energy and focus for practice. For example, Orlick (1986) recommended athletes develop focus plans that involve behavioral and verbal cues to achieve the right mental state for competition. Athletes could use focus plans similarly to find the right mental state for practice so they avoid days of low quality practice. Sport psychology interventions are typically used to prepare athletes mentally for competition. By making thoughts, feelings, and behaviors productive for performance, they help athletes perform to the best of their current abilities. Since practice is intended to extend those current abilities, a seemingly important objective of sport psychology interventions is to make thoughts, feelings, and behaviors productive for practice so that athletes extend those abilities as much as possible.

**Benefits beyond Skill Acquisition**

Identifying ways to enhance practice underscores skill acquisition as the primary purpose of practice, but participants experienced benefits of practice beyond improving physical skills.

**Confidence**

Increased confidence was one of the results of individual practice that participants valued most. It seems logical that improved competence would lead to increased confidence in one’s abilities. However, the confidence that participants discussed appeared to be a result of merely *having practiced*. Knowing they put in the effort to attain a desired level of competence led to their belief in their ability to perform at that level of competence in competition. Vealey, Hayashi, Garner-Holman, and Giacobbi (1998) found physical preparation to be a source of confidence and suggested its ability to enhance motivation and positive affect because it is controllable by the athlete. Individual practice is an especially controllable form of physical preparation since athletes can choose when, how often, and how long to practice alone.

**Autonomy**

In addition to having this flexibility in duration and scheduling, participants experienced autonomy during individual practice itself. According to Ryan and Deci (2000), people need to have a sense of autonomy to feel their behavior is self-determined, and self-determination
promotes intrinsic motivation for a behavior, such as individual practice. In individual practice, athletes are able to practice at their own pace, choose what they want to practice, and monitor their own performance without a coach “looking over their shoulder.” Moreover, individual practice may remind athletes that they play their sport because they want to—not just to oblige their team and coaches. Individual practice also provides athletes a sense of ownership over their performance when they assess their needs and improve on their own. Today’s youth athletes tend to depend heavily on coaches for instruction since much sport participation takes place in organized leagues and camps, so improving a skill on their own can remind collegiate athletes that they can trust their expertise from several years of playing experience.

The autonomy in individual practice is especially notable in light of Division I athletes’ highly structured lives. Ryan and Deci (2000) suggested that autonomy is a basic psychological need not only for intrinsic motivation but also for overall well-being, yet Division I athletes lack the autonomy enjoyed by most non-athlete students. In practices, coaches control what, when, and how long athletes practice, and the time commitment to their sport, including practices, games, meetings, and traveling, often exceeds a typical work week for most employees at their university (McCormick & McCormick, 2006). While most college students manage their academics on their own, practice schedules limit which classes athletes can take, and required study halls essentially dictate when to study (Watt & Moore, 2001).

It seems significant that an escape from the controlled lives required to play an intercollegiate sport is voluntarily practicing that sport. Kimball (2007) confirmed that Division I athletes lack autonomy but also found that close and supportive relationships with their team increase perceived autonomy. Commitment to teammates and coaches encouraged athletes to work hard to achieve the common goal they shared with their team, and the current study supported this relational autonomy. For example, P5 engaged in individual practice in part to set an example of work ethic for teammates and said, “I don’t want to let other people down, so I know I’m going to put in the time to get better, so that I can help them get better, so we can win.” When teammates and coaches motivate an athlete to practice, this practice is perceived as an autonomous behavior if it is done, not out of coercion, but out of commitment to them.

Positive Affect and Stress Relief

Other benefits of individual practice are positive affect and stress relief. Practicing made participants feel accomplished and good about themselves. These feelings seemed to result from
knowing they worked hard, especially since individual practice is a choice. Although enjoyment of practice contradicts Ericsson et al.’s (1993) contention that deliberate practice is “not inherently enjoyable,” Helsen et al. (1998) and Hodge and Deakin (1998) both found that deliberate practice in sport is enjoyable. Stress relief was discussed by several participants as a valuable part of practicing alone. Individual practice was an escape from the stresses of everyday life, related and unrelated to an athlete’s sport. Stress relief is difficult to reconcile with the theory of deliberate practice, which states that it deliberate practice exhausting and taxing. A possible explanation is that athlete’s individual practices may sometimes lack the intensity characteristic of true deliberate practice. This could be because athletes do not intend every session of practice to maximize improvement. As P3 explained, some days of practice are intended for “staying loose” and maintaining skills, instead of aggressive improvement of skills.

Implications

This study has several implications for practitioners, coaches, and athletes. First, individual practice can be used to increase confidence. By practicing a skill more, athletes may develop a sense of preparedness that gives them reason to believe in their ability. A coach can encourage athletes to practice outside of team practices so athletes see that they are capable of improving themselves on their own. Second, the practice habits of participants suggest practitioners can help improve practice quality by having athletes apply interventions such as goal-setting, focus plans (Orlick, 1986), and self-monitoring (Kirschenbaum et al., 1998; Martin & Toogood, 1997) to practice. Because an athlete can set her own goals and hold herself accountable using such interventions, the effectiveness of practice could be increased while the autonomy enjoyed in individual practice is preserved.

Finally, this autonomy makes individual practice a distinct experience from team practice that coaches and practitioners can highlight to urge athletes to engage in individual practice. Individual practice may appear to athletes as extra time committed to a sport they already practice, but the freedom to practice what and how they want at their own pace could attract athletes seeking more ownership over their performance and lives as athletes. In light of Kimball’s (2007) findings on relational autonomy, participation in individual practice may also be enhanced if coaches foster strong relationships with and among athletes so that athletes want to work hard for their team. Indirectly encouraging individual practice in this way seems
important since individual practice is a voluntary choice, rather than an activity coaches can mandate.

**Future Research Directions**

This study illuminated several directions for future research. Understanding of individual practice could be advanced by using different methodologies and by exploring in more depth the elements of individual practice highlighted in this study.

Quantitative methods are needed for more generalizable conclusions about athletes’ practice habits. A questionnaire could address some of the same themes in this study but with a larger sample, and results would provide a clearer picture of how athletes understand practice and the most salient components of practice to improve. Quantitative studies could also investigate whether athletes who regularly engage in individual practice tend to have certain personality traits, such as introversion or a growth mindset.

Studying populations at other levels of competition may produce different results from this study. NCAA Division I, II, and III athletes might vary in their quantity and quality of individual practice. On the one hand, Division I athletes may practice more on their own because they face more pressure to perform at a higher level than Division II and III athletes do. On the other hand, some Division III athletes may practice on their own more because they commit less time to organized activities than Division I athletes do.

Studying elite athletes would be especially useful to depict a model for high quality practice. Orlick and Partington (1988) found that elite athletes paid close attention to each practice by closely monitoring their performance and setting clear daily goals. These athletes were primarily from individual sports, so a study of team-sport athletes is needed. Furthermore, an updated study is needed to consider elite athletes’ practice habits in light of the advances in training and the present generation of athletes.

The potential for practice enhancement was a key finding of this study, and future research should determine how athletes can improve the quality of individual practice. It was suggested that the use of focus plans could help athletes find the proper energy level and attention needed for quality practice, so research is needed for a more thorough consideration of possible interventions and empirical support for them. It is also important to investigate how practice differs from competition and how those differences could affect interventions for practice enhancement. For example, athletes might have to reduce higher state anxiety in
competition due to the crowd and higher stakes of competition whereas practice may require elevating arousal levels for appropriate intensity.

Future research could also continue to explore themes found in this study. Participants emphasized the importance of “pushing” themselves to continue practicing when they were tired or struggling. Qualitative inquiry could compare thoughts, affect, and behavior when athletes do push themselves with those when athletes concede to fatigue or struggles and stop practicing. Thoughts during practice in general were only considered briefly in the current study. Although thoughts can influence performance, participants were not aware of their thoughts or did not consciously decide how they should think during practice, so more studies are needed to understand why.

**Limitations**

A limitation of this study is the convenience sampling. Participants were sampled from one university and composed only a fraction of the university’s athletes, so findings may only apply to them since practice habits could be a function of the norms within a team or university’s athletic department.

Another limitation is the absence of multiple data-collection methods. Ericsson et al. (1993) had violinists track their practice habits in a week-long diary to verify retrospective recall of practice, and Partington and Cushion (2011) used direct observation to guide interviews with coaches. Without observation of practice in the present study, describing the content and structure of practice depended on participants’ self-awareness and honesty in interviews. Details from participants may have been limited because practice might have been a topic that they rarely thought about in depth before the interviews. As is the case with qualitative interviews in general, participants also may have had thoughts or feelings that they could not articulate. Despite these limitations, it is also possible that being observed or tracking practice habits in a diary would have influenced athletes’ thoughts and behaviors.

**Conclusion**

This study’s primary purpose was to understand college athletes’ experiences of, attitudes toward, and approaches to individual practice. Although the results are not generalizable to all college athletes, qualitative interviews provided the perspectives of the nine participants on a topic previously unexplored. Individual practice had perceived value as a way to enhance performance and as an escape from the athletes’ structured lives. The importance of practice to
performance indicates practice deserves more attention from researchers and practitioners. For researchers, there are various aspects of practice that are absent in the literature yet contribute to the quality of practice. For practitioners, habits of low quality practice suggest the need to apply sport psychology interventions to enhance practice quality. Practice is a performance, not just mere participation. While the most memorable displays of excellence—“clutch” plays, miraculous comebacks, or complete dominance—may occur in competition, most opportunities for excellence occur in practice.
REFERENCES


Ericsson, K. A., Krampe, R.T., & Tesch-Römer, C. (1993). The role of deliberate practice in the


APPENDIX A
Interview Guide

What are athletes’ experiences of, attitudes toward, and approaches to practice outside of formally organized practices led by coaches?
1. What do athletes do to practice outside of formal coach-led practices?
2. How do their approaches to practice compare to research-based recommendations for practice?
3. How do athletes come to design the content of their practice the way that they do?
4. What do athletes believe about their ability to maximize the effectiveness of practice?

I. Rapport Building
1. Could you tell me about your current sport participation?
   a. How long have you been playing?
   b. How did you come to play?
2. Grand Tour: What are the most important factors that determine an athlete’s level of performance?

II. What do athletes do to practice?
3. How often do you practice outside of organized practices?
4. Suppose I walk into one of your individual practices…
   a. What would I see you doing? Could you describe a “typical” practice for you?
   b. What other activities might you do on another day?

II. Approaches to practice
5. Would you say you “plan” your individual practices? In other words, do you know what you’ll be doing before you step into the gym/rink/field?
   a. If YES: How do you go about planning practice?
      i. How did you come to plan that way?
   b. If NO: Can you elaborate on your choice not to plan?
6. How do you determine the content of your practice?
7. What areas of your game are important for you to improve? How much time do you spend practicing them?
8. Do you set goals for each practice?
   a. If YES: What? How do you come up with these?
   b. If NO: Can you elaborate?
9. Think about some drills you often do. What choices are there to make about the design of those drills?
a. How do those choices affect performance?

10. Would you say you design practice to maximize effective performance?
   i. If YES: How so?
   ii. If NO: What could you do better? What keeps you from doing so?

11. Your sport is a team sport with constantly changing conditions and other players. Would you say you practice in a way that accounts for these conditions?
   a. How well do you replicate what’s done in performance?

12. What are the pros and cons of practicing alone and practicing with teammates?

13. Are there any drills or exercises that you are particularly proud that you do?

14. How has your practice evolved since your early career?

II. Experiences of practice
15. How do you monitor your performance in practice? How do you generate feedback?
   a. How do you know when you’re getting better?

16. Do you think about anything in particular when practicing?
   If YES: What and how so?

17. How enjoyable are the drills/exercises you do?

III. Attitudes toward practice
18. For what reasons do you engage in individual practice?

19. For you, what does it mean to get the most out of practice?
   c. What can you do to ensure you get the most out of practice?
   d. What are the most important qualities of a good practice?
   e. How important is performing well in practice?

20. How would you describe your attitude toward practice?

I feel like our conversation is coming to an end but before it does…is there anything else you can tell me that you haven’t had a chance to say that you think will help me better understand the meaning and process of your off-season practice?
APPENDIX B

CONTACT SUMMARY FORM

Participant Name/ID: ________________________________________________
Participant Contact Info: ____________________________________________
Interview Date & Site: ______________________________________________
Start & Stop Time of Interview: ________________________________

1. Summarize what s/he said about practice.

2. What were the main issues or themes that struck you in this interview/focus group/observation?

3. What was the demeanor (e.g., tone, expressions, body language) of the participant throughout the interview?

4. Questions to add and/or delete

5. Any other impressions and specifics about this participant/interview?
APPENDIX C

Participation and Informed Consent

Dear __________:

My name is Billy Low, and I am currently a graduate student at Miami University in the department of Kinesiology & Health. I am conducting a study for my thesis and have chosen the topic of athletes’ approaches to practice.

You are invited to participate in my thesis. I will ask you to participate in an interview about your experiences and perceptions of practice for your sport. This interview will be audio-recorded and transcribed verbatim. Your name will not be associated with your responses in any way (that is, the information you provide will be used anonymously and grouped with the information from other interviews). The interview in its entirety should take no more than 1 hour. Your participation is voluntary and you may withdraw from the interview at any time or refuse to answer any questions that you do not wish to answer. You will not be asked to do anything that exposes you to risks beyond those of everyday life. The benefit of this project, educationally, is that it will help me learn how to do research, as well as help me understand sport practice.

If you have further questions about this project, please contact me at _______ or my adviser, Dr. Robin Vealey, at ________.

Thank you for your participation and for helping me with my thesis. I am very grateful for your help and hope that it will be an interesting process for you. You may keep this top portion of the page.

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Cut/tear at the line, keep the top section and return this bottom section.

I agree to participate in the project on athletes’ perceptions and experiences of practice. I understand my participation is voluntary and that my name will not be associated with the information I provide.

Participant’s name ___________________________________________

Participant’s Signature ________________________________________

Date ________________________________________________________