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Expert Approaches to Mental Toughness Development in the High Risk Sport of Diving

Abstract

Research focusing on mental toughness development and high risk sport is limited to one examination of elite gymnasts' perceptions. Coaches have acknowledged that mental toughness is important to performance success, while admitting they do not know effective development strategies. The aim of the current research is to address both these concerns by employing a grounded theory approach to ascertain elite diving coaches perceptions of mental toughness development and what mental toughness is. Seven diving coaches volunteered and were interviewed for an average of 49 minutes. They all coached an athlete that participated either in the world championships or Olympic games since 2008. Participants reported that mental toughness was the ability of a diver to perform a movement in a crucial moment that requires focus, extending beyond their comfort zone, overcoming fear, and never giving up. Mental toughness may not be the appropriate term due to its lack of multicultural sensitivity. Participants felt that dealing with adversity was something divers would have to constantly process. Mental toughness can be developed by the coach, the environment, or individual athlete. Unique attributes specific to divers were an awareness of self and a distinct level of knowing what the athlete was going to do. More research needs to be conducted to determine if these concepts can be generalized to other high risk sports. Future research could help establish a valid quantitative measure of mental toughness development.

Document Type

Capstone

Degree Name

M.A.

Department

Graduate School of Professional Psychology

First Advisor

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Second Advisor

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Keywords

Diving, Mental toughness, High risk sport

Subject Categories

Psychology

Publication Statement

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Running head: DEVELOPING MENTAL TOUGHNESS IN A HIGH RISK SPORT

EXPERT APPROACHES TO MENTAL TOUGHNESS DEVELOPMENT IN THE HIGH RISK
SPORT OF DIVING

A Master's Project
presented to
the Graduate School of Professional Psychology
University of Denver

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Sport & Performance Psychology

by
AARON D'ADDARIO
Dr. Artur Poczwardowski, Master's Project Chair

MAY 2014

The undersigned, appointed by the Dean of the Graduate School of Professional Psychology,
have examined the Master's Project entitled

EXPERT APPROACHES TO MENTAL TOUGHNESS DEVELOPMENT IN THE HIGH RISK
SPORT OF DIVING

presented by Aaron D'Addario

a candidate for the degree of Master of Arts

and hereby certify that in their opinion it is worthy of acceptance.

Artur Poczwardowski, Ph.D., Chair

Jamie Shapiro, Ph.D., Committee Member

ACKNOWLEDGEMENTS

This project is dedicated in the honor Donnie Craine and Mike Lyden. Great coaches, and wonderful human beings who are no longer here to influence and shape the lives of young divers. They will be missed, this research is a token of the author's appreciation for their kindness, openness, and respect they valued and lived by. Their impact on the author's development and the development of the sport of diving is immeasurable.

A special thank you is given to the participants of this research who graciously volunteered their time to participate. Their openness to provide significant insight into their experiences as divers and coaches needs to be acknowledged. Without that this research would not have been possible.

EXPERT APPROACHES TO MENTAL TOUGHNESS DEVELOPMENT IN THE HIGH RISK
SPORT OF DIVING

Aaron D'Addario

Dr. Artur Poczwadowski, Master's Project Chair

ABSTRACT

Research focusing on mental toughness development and high risk sport is limited to one examination of elite gymnasts' perceptions. Coaches have acknowledged that mental toughness is important to performance success, while admitting they do not know effective development strategies. The aim of the current research is to address both these concerns by employing a grounded theory approach to ascertain elite diving coaches perceptions of mental toughness development and what mental toughness is. Seven diving coaches volunteered and were interviewed for an average of 49 minutes. They all coached an athlete that participated either in the world championships or Olympic games since 2008. Participants reported that mental toughness was the ability of a diver to perform a movement in a crucial moment that requires focus, extending beyond their comfort zone, overcoming fear, and never giving up. Mental toughness may not be the appropriate term due to its lack of multicultural sensitivity. Participants felt that dealing with adversity was something divers would have to constantly process. Mental toughness can be developed by the coach, the environment, or individual athlete. Unique attributes specific to divers were an awareness of self and a distinct level of knowing what the athlete was going to do. More research needs to be conducted to determine if these concepts can be generalized to other high risk sports. Future research could help establish a valid quantitative measure of mental toughness development.

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Expert Approaches to Mental Toughness Development in the High Risk Sport of Diving

Research in performance psychology has mostly focused on enhancement and skill development of the performers. Coaches may be one of the most impactful stakeholders in helping the performer reach their goals and have a positive experience in sport. High risk sport domains present a unique subset of athletes. They choose to participate in activities that are socially acceptable yet contain a significant risk of bodily injury or harm on a constant basis (Castanier, Le Scanff, & Woodman, 2010). Athletes that choose to participate in high risk sports should accept that by participating they are putting themselves in some danger; these athletes are inherent risk takers (Woodman et al., 2013). High risk athletes have been shown to have distinct personality characteristics: low conscientiousness, high extraversion, and high neuroticism (Castanier et al., 2010).

Research has shown that risk taking athletes are not all the same, some perform precautionary behaviors that help them be in control and reduce the potential risk (Woodman et al., 2013). Risk taking sports are unique in that an athlete can take precautions, prepare yet still suffer a significant adverse consequence, whereas the athlete that does not prepare as much could experience a “close call” yet avoid injury (Woodman et al., 2013). Insight from a group of elite coaches, most of whom were high risk athletes themselves offers a unique perspective into how mental toughness is developed. The participation in high risk sports is growing based on their increased popularity and involvement in the winter Olympics (Seiler, 2014). As research in developing mental toughness increases, this research needs to address high risk sports.

Applying a qualitative method gives researchers a deep understanding of how mental toughness has been developed by a group of highly successful coaches. Research on the

development of mental toughness has covered a variety of sport domains: gymnastics (Thelwell, Such, Weston, Such, & Greenlees, 2010), swimming (Driska, Kamphoff, & Armentrout, 2012), judo, rowing, pentathlon, squash, athletics, and rugby (Connaughton, Hanton, & Jones, 2010), and Australian football (Gucciardi, Gordon, & Dimmock, 2008; Gucciardi, Gordon, Dimmock, & Mallett, 2009). Only the latter studies investigated coaches exclusively. Only one study examined a high risk sport population, gymnastics (Thelwell et al., 2010). The sport of diving has not been studied, meaning a qualitative investigation is warranted.

Mental toughness is a concept that has evolved greatly within performance psychology for the past thirty years. James Loehr was one of the first to write about mental toughness in his seminal book *Mental Toughness Training for Sports: Achieving Athletic Excellence* (Loehr, 1986). He applied an anecdotal approach to developing the concepts, basing them around interactions with athletes he was consulting with since there was no empirical research available. Loehr conceptualized mental toughness as a coping skill that would assist athletes in remaining relaxed, calm, and energized adequately to perform. (Connaughton, Hanton, Jones, & Wadey, 2008a).

Research into developing a generalizable definition of mental toughness was needed since it is one of the most popular and least understood concepts of performance psychology (Jones, Hanton, & Connaughton, 2002). Ten elite athletes participated in a qualitative methodology to develop a definition of mental toughness. The definition that emerged was:

Mental toughness is having the natural or developed psychological edge that enables you to: Generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer. Specifically, be more consistent and

better than you opponents in remaining determined, focused, confident, and in control under pressure (Jones et al., 2002, p. 209).

This definition is more focused on what athletes can do when mentally tough, but not what mental toughness is. Jones contends that the definition reflects the product of what mental toughness can produce in an athlete, which is what coaches and athletes are most concerned with (Connaughton et al., 2008a). Subsequent research has been conducted examining the framework of mental toughness (Jones et al., 2007), the development and maintenance of mental toughness (Connaughton, Wadey, Hanton, & Jones, 2008b; Connaughton et al., 2010). A limitation of this research is that three of the four studies examined the same elite athletes from various sport domains. The participants may have been primed to be more aware of mental toughness, than athletes not participating in the research. Additionally this research used athletes' perceptions of mental toughness, mostly focusing on definitions and framework. The research addressed global development and maintenance of mental toughness, not providing a specific picture or strategies of development. Thelwell et al. (2010), Driska et al. (2012), and Gucciardi et al. (2008, 2009) have expanded the research to include novel sport domain and participants. Continuing this expansion into a high risk sport domain; and investigating coaches who have rarely been researched makes this topic relevant.

According to Gould, Hodge, Peterson, and Petlichkoff (1987), 82% of college wrestling coaches rate mental toughness as the most important psychological attribute for success, however only nine percent believe they are successful at developing mental toughness. The lack of a definition that emerged from this research motivated Jones et al. (2002) to conduct their research. Coaches have known how important mental toughness is to the success of their

performers. This research is twenty-seven years old and no validated theory of mental toughness development exists. This lack of a development strategy adds to the need for the current research.

Investigating mental toughness development experiences of coaches through a qualitative method is needed to develop a valid quantitative measure (Creswell, 2007). Quantitative measures of mental toughness are being developed, but are in the early stages of development and validation (Gucciardi & Gordon, 2011). The mental toughness questionnaire-48 (MTQ-48; Clough, Earle, & Sewell, 2002), was developed to relate the theory of hardiness from health psychology to mental toughness. The goal of the MTQ-48 was to measure who is mentally tough, not how mental toughness was developed. Criticism of the MTQ-48 surrounds the connection the researchers made between hardiness and mental toughness. No research has found a direct link between the two concepts; it appears that Clough and colleagues (2002) rooted their definition of mental toughness to Loehr's anecdotal research. An additional shortcoming is that Clough and colleagues (2002) did not provide any details regarding the participants or data collection procedures (Connaughton et al., 2008). Connaughton et al. went further by, "advising against its use in future mental toughness investigations" (p. 198).

Significant issues surround the various quantitative tools used for assessing mental toughness. Much of the research is based around anecdotal evidence or connections to other established theories (Connaughton et al., 2008). The entire discussion of quantitative assessment tools was based around identifying what is mental toughness. No assessments have been developed in regards to the current research question of how mental toughness is developed (Gucciardi & Gordon, 2011). Researchers have different opinions on whether mental toughness assessment should be constructed on a global level or specific to sport domains (Gucciardi &

Gordon, 2011). It is unreasonable to expect researchers to develop specific assessments for every sport that people participate in. Given the individualized and encompassing nature of mental toughness researchers have been unable to establish an assessment that accurately reflects these issues. The lack of an assessment tool for developing mental toughness supports investigating development strategies based on a qualitative methodology.

Development of mental toughness has been researched by examining athletes', coaches', and sport psychology consultants' perceptions (Connaughton et al., 2008a; Connaughton et al., 2008b; Connaughton et al., 2010; Driska et al., 2012; Gucciardi et al., 2008; Gucciardi et al., 2009; Jones et al., 2002; Jones et al., 2007; Thelwell et al., 2010). The research has either focused on assessing mental toughness as a global behavior across many sports, or examining specific domains. The advantage to a global investigation is that it is generalizable. Examining specific domains identifies unique aspects of developing mental toughness. The current research examined a specific domain and built on the previous studies to examine coaches exclusively (Gucciardi, 2008, 2009). Past research has identified four separate situations when mental toughness can be developed: during the attitude formation, training, competition, and post-competition (Jones et al., 2007). Jones and colleagues (2007) also identified different attributes that helped the development of mental toughness during these situations. Attributes were: belief, focus, goals, controlling the controllable, and handling success and failure.

Eleven Australian football coaches defined mental toughness, and three categories emerged: characteristics, behaviors, and situations (Gucciardi et al., 2008). Within these categories, several attributes were identified that helped enhance mental toughness: self-belief, motivation, tough attitude, concentration and focus, resilience, and handling pressure. When

developing psychological skills training for mental toughness, eight areas to focus on were: confidence or self-belief, attentional control, motivation, commitment or determination, positive attitude, resilience, handling pressure, and quality preparation. A follow up study (Gucciardi et al., 2009) with the same participants extended the findings from defining mental toughness and investigated how coaches developed it, revealing five areas: early childhood experiences, training environment, coaching philosophy, coach-athlete relationship, and specific strategies. Coaches identified actionable strategies that coincided with each area: a supportive and positive coach-athlete relationship, promotion of holistic development of life skills, viewing mistakes as opportunities, positive reinforcement, clear communication, exposing athletes to pressure situations, and pushing performers to their limits during physical practice (Gucciardi et al., 2009).

In the present investigation, diving coaches were chosen to be studied due to the risk taking nature of the sport and to add a novel perspective of mental toughness development to the literature. Researching mental toughness development in the high risk sport domain of diving adds to the mental toughness literature in two ways: focusing on a sport that has yet to be studied in relation to mental toughness development and integrating mental toughness development in a high risk domain. The purpose of this study was to investigate elite diving coaches' perceptions of what mental toughness is and how mental toughness is developed in a high risk sport domain.

Methods

Participants

Seven elite diving coaches volunteered to participate in the study; ages ranged from 33-64 with an average of 48 years of age. Each coach is active, at a USA diving club or NCAA

D-I university, with a range of coaching experience from 7-36 with an average of 22 years. There were six males and one female in the study. Six of the participants were caucasian and one latino, six were American and one was considered transnational. In order to be considered elite, the coach needed to coach at least one athlete that has competed at the world championships or Olympics. The participants coached 39 athletes to the world championships with an average of six per coach. The participants had coached 12 Olympians with an average of two per coach; however two had not reported coaching any Olympians, one reported coaching five. The participants as athletes spent an average of 15 years in their sport, six were divers and one was a basketball and baseball player. Two participants had competed in the Olympics in diving, one was a world champion finalist, one was an Olympic trials finalist, two were senior national finalists, and one was a collegiate basketball and baseball player. For the purpose of this study, the coach needed to have been the athlete's primary coach for at least one year. Each participant was asked the name of the athlete that qualified them to participate and the researcher confirmed it with rosters of the event(s). This level of coaching has been studied by other researchers (Gucciardi et al., 2009). Convenience sampling was used to find qualified participants from event results. Inclusion criteria was established by determining what coaches in the United States had coached athletes that qualified for the 2009, 2011 and 2013 FINA diving world championships, and the 2008, and 2012 summer Olympic games. This criteria produced a sample of over twenty coaches.

Research Design

The qualitative methodology in the present study was framed within a grounded theory approach. This investigation was modeled after previous research on developing mental

toughness, and applied to a new population and sport domain (Connaughton et al., 2010; & Gucciardi et al., 2009). This research is idiographic and adheres to a constructivist paradigm, investigating a specific population's development strategies of mental toughness (Creswell, 2007).

Instrumentation

The interview guide used was adapted from previous qualitative research on mental toughness (Connaughton et al., 2010; & Gucciardi et al., 2009). The guide was divided into two sections: defining and developing mental toughness. The first part focused on the participants definition of mental toughness. Examples of questions were: What is the essence of mental toughness in diving? What are the mental toughness attributes of platform divers?

The second part of the guide focused on developing mental toughness. Examples of questions were: What are some personal experiences you have used in developing mental toughness? What ideas do you have for young coaches on developing mental toughness? The interview guide consisted of twenty open ended questions (Appendix A). Opportunities for follow up questions and clarification questions were provided, such as 'How so?' and 'Can you give an example of this?'

Procedures

This project was approved by the Institutional Review Board (IRB) for the protection of human subjects. Participants received the initial recruitment email, and if they responded and agreed to participate were sent the informed consent and the interview guide. Two days prior to the interview time participants were emailed a reminder. Participants were contacted via phone on the interview day and a Skype session was established. This session was audio recorded. Data

was kept double password protected on an external hard drive. Each interview was numbered and the name of the participant removed to ensure confidentiality.

A pilot interview was conducted with a NCAA D-I diving coach prior to recruiting qualified subjects. Four participants were interviewed then preliminary analysis was conducted. Three more participants were interviewed after the preliminary analysis. Interviews lasted a range of 27-95 minutes with a mean of 49 minutes.

Data Analysis

Interviews were transcribed verbatim and re-read so the researcher could be familiar with the content. The analysis began with an inductive process (Creswell, 2007). Interview content was grouped together and meaning units were developed from the responses. The data were kept organized by the flow of the questions and topics. Responses from all participants on the topics were grouped, meaning units were then compared and contrasted with each other forming lower order themes. Lower order themes were then examined and higher order themes were developed (Creswell). Upon conducting four interviews the data were transcribed and preliminary analysis conducted. An abductive data analysis technique was employed, after analyzing the data, more interviews were conducted. This technique allowed for further refinement of the interview process based on the preliminary results. Concepts from previous research were compared in a deductive manner to the themes that developed from the data to ensure validity of the results. Upon completion of the data analysis by the primary researcher, the results were externally audited by the project chair. The audit process consisted of the chair examining the table and figures then analyzing the structure and asking for clarifications of the theme creation or meaning units used to support the theme.

A technique used in consensual quantitative research (CQR) was applied to provide context of the responses. The technique describes variation in the data by labeling frequency of meaning units that form the lower and higher order themes (Hill, Thompson, & Williams, 1997). Past research has employed grounded theory data analysis within a case study providing precedence for the mixing of approaches with qualitative research (Yeh & Inman, 2007). The constant comparative method of grounded theory has been applied within a CQR framework (Hill et al., 1997). By employing the labeling technique of CQR with the current research, it provides readers with a clear picture of how many participants responded to each meaning unit or theme.

Results

The results are presented in two sections being consistent with the interview guide. Section one includes: A definition of mental toughness, situations where mental toughness may be required, attributes of mental toughness with considerations of platform and springboard divers. Section two includes: Development strategies, considerations of a high risk domain, and recommendations to neophyte coaches. In accordance with the data analysis technique used in CQR the responses given by the participants were labeled *general* if 6-7 participants reported them, *typical* if 4-5 reported them, *variant* if 2-3 reported them (Hill et al., 1997), and *atypical* if 1 participant reported it (Yeh & Inman, 2007).

Definition of mental toughness in diving

The participants expressed definitions that have several commonalities, yet unique aspects supporting the idea that mental toughness is a highly individualistic concept. Generally participants discussed performing in crucial moments as being mentally tough, “before the time

the dive actual begins, to when it is in the water.” Typically the ability to focus and leave their comfort zone was included, “to focus on what you need to focus on through all the distractions,” and “doing the movement when you do not want to do it.” Variant responses included never giving up, “miss a dive and then being able to move on”, trust in themselves, “allowing yourself to dive,” and control, “someone who is in control of their thoughts and emotions” and, “in control of your actions, uncomfortable but in control.” The participants added five atypical responses of what mental toughness was: (a) doing a physical movement with little distraction, (b) mental toughness can be trained, (c) toughness was the wrong term due to its masculine connotation, (d) composure is part of mental toughness and (e) mental toughness was an attitude of how confident the diver was in their ability.

Summarizing the participants’ responses the definition of mental toughness in diving is the ability of a diver to perform a skilled movement in a crucial moment that requires the individual to be focused, beyond their comfort zone, overcome fear, never give up, trust the movement with little distraction while being composed, in control, and confident. Mental toughness can be trained, and may not be the most accurate term for the performance concept due to its lack of multicultural sensitivity and clichéd origin.

Situations in diving requiring mental toughness

The situations that participants reported requiring mental toughness are presented in Figure 1. The lower order theme of the situations was organized by location: training situations, and competition situations. The higher order theme of dealing with adversity emerged in these situations. This participant provided an example of dealing with adversity in the training environment:

When you get lost in the air you lose perception of where are you in relation to the water, then you smack and you hurt yourself. Then you need to have that mental toughness to be able to overcome that accident and then try to do the dive again, and again.

Processing the fear of a new dive or a crash was a typical response of the participants for generally dealing with adversity in training. This participant provides an example, “when you’re working out and you have to try a brand new scary hard dive.” A variant response is making changes in training, “Learning where you have to take a verbal command and make a behavioral change, that is new, that is uncomfortable, that is fearful.”

An atypical response was when the athlete was not at one hundred percent at practice, “when they cannot jump or cannot spin when their minds are tired from taking tests all day long, and force them to dive when diving is the hardest thing in the world to do.”

Competition situations were generally reported as requiring mental toughness. A variant response was processing the pressure of competition as explained by this participant, “When you are in a big competition.” Another variant lower order theme was responding when things are going well, “Not get wrapped up in everything going well.” The opposite scenario was also a meaning unit, “Sometimes a top performance actually come(s) from a little bit of a mess on one of the dives.” Dealing with distractions, responding after a competitor performs well or not, and hitting the board were atypical meaning units that divers have to deal with in a competition.

Attributes of a mentally tough diver

The participants reported 17 attributes of mentally tough divers. The attributes ascertained from the participants were then compared to previous attributes (Jones et al., 2007). Unique attributes found in the current research are indicated by an asterisk. Table 1 presents the

attributes by frequency of response, and provides support with quotes from the participants.

Generally mentally tough divers have the ability to focus, be uncomfortable, and a high level of knowledge about diving.

Typical responses included divers exhibiting a high level of confidence, distinct knowing, and awareness of identity. The confidence was a genuine knowledge that the athlete was going to accomplish the skill. The mentally tough athlete has a high level of knowing what they are about to attempt, not hoping but knowing. The awareness of identity attribute was highly valued by a participant.

Five attributes emerged as variant from the responses of the participants: (a) a vivid imagination, (b) ability to relax, (c) control, (d) being prepared and (e) trust.

Seven responses were atypical attributes of mental toughness: (a) ability to manage anxiety, (b) having a daily vision, (c) a high value for diving, (d) ability to reframe, (e) being consistent, (f) being superior competitors and (g) an ability to reach potential.

The participants generally reported that platform divers had to deal with the natural fear of the event. Not necessarily a fear of heights, but the constant fear of diving from 33 feet in the air:

Fear, there is a lot of fear. Fear of injuries. There is a lot of fear in platform diving. I was afraid the last day I dove in the Olympics. Just doing my dives on platform everyday, it was always there; it was like my little friend.

Participants' variant responses were that divers were: born with the attribute (By definition a platform diver has more mental toughness than a normal population, they overcome that innate desire not to jump off of high buildings), the ability to process the fear, knowing it

will not be eliminated (I was a platform diver, and every dive I did I was afraid. It was a part of what I did. It is not that you overcome fear it is that you respect fear) and trust in their coach, (discipline by tower dives to hold to the call).

The participants generally reported that an attribute specific to springboard divers was being in the moment, “Spring boarders have to (be) more in the moment on how to make that dive work, how to make the springboard work for them.” A variant attribute was having the ability to be in time with the diving board, “Timing of the board, divers can lose timing quite quickly and allowing the loss of timing to affect the whole dive is a huge mistake.”

Developing mental toughness in diving

The higher order themes presented in Figure 2 are inter-related and contribute to the development of mental toughness. Three higher order themes emerged: (a) sport environment, (b) personal sources and (c) coach behaviors. The following triad helps mental toughness development be implemented by coaches in a clear and systematic method.

The environmental theme was generally divided in competition and training situations. Sport specific support systems influenced mental toughness development. A typical response was that divers needed to experience success to develop mental toughness. This idea was reflected in this participant’s response on how to help the diver succeed in competition, “You have to put some of your best dives in the first one, and you have to reserve the higher degree of difficulty dives that you know they can hit.”

A typical belief was that divers needed to experience failure or frustrating situations in competition to build mental toughness. A balance between success and failure appeared to be required to build mental toughness. This was best summarized as, “It almost takes big failures

for them to finally admit it, and then you say I'm so glad you told me because now I can teach you everything you ever needed to know." The participant added, "It sucks to say but I do believe they are not really going to grasp down on the ideas of thinking right in sport until their minds have completely failed them."

A variant response from the participants was decreasing the importance of the competition as a way of developing mental toughness. The following response communicated that competition was something that would help build mental toughness. It is not threatening, and does not have a negative consequence:

The more competitions you can be in, that helps become more mentally tough and as you progress putting them in higher level competitions. See how you stack up against some of the best in the country, they are not going to bring harm to you.

The training situations that developed mental toughness were: creating difficult situations for divers to overcome, preparing divers for competition, having daily goals in practice, encouraging competitions all the time. A typical method of developing mental toughness during training was to create situations of high difficulty for the athlete to overcome, so that competition would not be as difficult:

I always try to make everything harder and worse than it actually is. You need to go hard and then make the hardest of every circumstances, make the worst of a situation so then when the real situation comes it is a piece of cake.

Participants stated typically that teaching an athlete in training to be prepared was developing mental toughness, "We practice lists, with scenarios, we do visualization, we try to

fill in all the gaps.” The participant presented situations to the athletes during the visualization or during actual practice to help prepare their minds to the fullest degree.

Two variant responses included encouraging competitions in all settings during training, and setting daily goals to help clarify the path toward success. Competitions in practice were employed for several reasons, expressed by the participant:

Some kids are very affiliation oriented, they do not want to let the team down. We will do team drills where the kids will all have to hit their front optional before they go on, if they are the last one everyone will cheer them on and they will do a great dive.

The idea of setting daily goals was summarized by the following participant, “They have got to want to get a little bit better everyday, and sometimes that is not going to happen and that is ok. That’s why we would try to establish daily goals.” The awareness that the expectation is to improve everyday, but it may not happen everyday indicates that this participant is highly aware. The constant use of ‘we’ shows the participant realized that mental toughness development is a collaborative process between the athlete, the coach, and their teammates.

Two typical statements about athletes developing mental toughness were about increasing confidence, and awareness. A participant commented that confidence was, “Giving them a sense of pride in themselves.” Another spoke about the awareness of an athlete prior to winning a bronze medal at the Olympics, “He knew it, he believed it, he knew great things were going to happen that Olympic Finals morning.” Typically participants spoke about the athlete needing to have an awareness of their thoughts, emotions, and identity to be mentally tough. Overall awareness was gleaned from this statement, “I just think the ones who end up being really great, a lot of times are the ones who figured it out, what works for them what their niche is.”

It was typically reported that developing the sport intelligence attribute that was mentioned developed mental toughness. Several participants commented on the divers learning as much knowledge as they could about the sport. This idea was summarized by the previously cited quote in the attributes section. Another participant mentioned that the intelligence can be cognitive in nature:

The only thing I am going to talk about is where your frame of mind was before you attempted that dive, how the dive ended up, and if it did not end up the way you wanted, I want you to tell me the exact moment, the exact moment where you knew you lost proper thought.

Another typical theme of development was to be aware of the individual differences of the athletes. The following participant talked about the roots of his coaching philosophy, "Every human being has strengths and weaknesses, you have to figure out how to make it work for you. You have got to know your athletes. That is how I coach, from my personal experiences."

Several lower themes were expressed variantly: (a) Reflecting with the athlete on successful experiences, (b) autonomy for the athlete, (c) communicating to the athlete and (d) discipline were the behaviors that developed mental toughness. Taking the time to reflect with the athlete and enhancing autonomy were expressed together:

Help people help themselves learn the techniques they need to be successful. If I can get them to tell me what they were thinking when they were successful then they own how they got mentally tough, its theirs its not me saying you need to do this, no you just learned how to be mentally tough on your own.

Participants stated that communicating with athletes would help enhance their knowledge and control. This can be seen in the following response for a participant:

I told her one summer, you are going to learn how to spot, and if it takes a whole summer of back and reverse one and a half's then it takes a whole summer, our goal this summer is to learn how to spot, we are going to start these practices on Monday.

Discipline was expressed by variant participants, however one stated it was a behavior he had used more in the past. "Until recently I was a tough coach, in other words there was behavioral mods set up to make changes. There was punishments or rewards, they were both extremes I always had a special word when they made the change." Three atypical lower order themes that were developed included: teaching mental skills, accepting the fear, and consistency to build mental toughness. A participant reported using a structured presentation of mental skills training to develop mental toughness. This same participant helped teach athletes to accept that their fears would be present, and to process the fear mindfully.

High risk considerations

A general response from the participants about the high risk considerations of mental toughness was that the natural fear of diving needed to be acknowledged and processed with the divers. A higher order theme from the participants was the idea that the fear will be constant, the mentally tough diver would learn to deal with it:

We talk about fear a lot, I truly believe you are completely wasting your time if you are trying to get rid of your fear, because it is part of you, it will always be there it is not going anywhere. Your making the conscious decision not to let you fear affect you to do the dive.

A lower order theme about fear was processing the response to attempt a move that overrides the normal human reaction. This participant references the idea in the context of executing a dive in a specific direction, “Stay with that movement no matter what the feeling is because it is a completely overriding response to what you would normally or naturally want to do when falling backwards.”

The desire to be a risk taker was a typical higher order theme that included: being a fixed personality trait, the need to show off, and the desire to be a thrill seeker. This participant felt mental toughness would correlate with participation in diving in helping to process the natural fear, “There is a good strong correlation in mental toughness and participation because of importance to the obvious one, the obvious fear.” The following participant summed up the need to show off, “the acrobatic showmanship of it.” This participant explained that diving can allow people to be thrill seekers:

A number of them get a thrill of jumping off 33ft, spinning, seeing the water go by 3 or 4 times, kicking out and then just putting their flat hand on the water and just smoking that dive and getting that thrill of just surfacing and hearing roar of the crowd, it is a thrill.

A third theme that emerged dealt with how the diver conceptualizes and decides to voluntarily take these risks. A variant response from the participants was that divers make the decision that the positive outcomes of attempting the skill outweigh the potential physical harm. This is effectively summarized in the following statement, “I want to do this dive well way more than I am worried about what is going to happen.” A meaning unit that contributed to the category was that diving was more risky with more personal investment. This participant stated:

Some do it for the thrill, for the scholarship, for the place finish at the next meet, to travel, whatever their rationale is for it, it is inherent to each individual. Some do it just to be part of a group so it does not take much risk in that scenario.

Ideas for neophyte coaches

Results presented in Figure 3 provide an conceptualization of the explanations participants gave when asked about ideas they would have for neophyte coaches that want to teach their athletes to be mentally tough. Two primary high order themes emerged: Information that coaches could research and learn about, and behaviors to be aware of to increase mental toughness development. A typical response from the participants was that these themes need to be considered through the lens of individual differences. As previously cited, coaches need to discover what works for their individual athletes, “get experience on working with each individual and learn the individual and how they respond to what you are giving them. It is through that experience that you gain that correspondence of trust.” The participant continued, “your coaching experience of working with ones that you have had, you know this worked with that person.” The participant suggests that the previous experience of a coach will help the coach deal with individual differences in the future. The information each participant suggested a coach needs to know was individualized, all themes were atypical: Toughness does not need to be masculine, the concept of thinking right in sport, laws of learning, and failure is due to a lack of preparation.

The second higher order theme that emerged was behaviors that coaches could implement or become more aware of that would develop mental toughness. A variant lower order theme was classified as humanistic behaviors, including: following the athlete and being genuine. A

participant discussed following the athlete, “we allow them to go there when they have to.” This participant was genuine when discussing the fear in diving, “it is freaking scary and if your willing to listen to what I have to say.” This participant valued honesty and being genuine with their athletes. A participant mentioned that coaches need to be more than coaches, “You have to educate these kids on these tools while they are doing their dives in the middle of practice.”

The participants reported several ideas on how young coaches could process fear with their athletes. A participant responded that coaches need to build trust to overcome the fear of a high risk sport, “To get over that fear if they can trust you and know what you are talking about is ultimately going to keep them safe.” Gradual systematic desensitization was an approach used by a participant, “if you give the fear in a gradual method we allow these people to become tough gradually, and we allow them to go there when they have to.” Acknowledging the fear was a response about processing fear, “Have to acknowledge that this is a sport that has fear inherent in the sport and I think communication as a coach is always something that is really important.”

Discussion

The purpose of this research was to investigate elite diving coaches ideas of what mental toughness was and how they believe it is developed specifically within a high risk sport. The participants’ definition had similarities, but each had their individual aspects. Situations where mental toughness was required were discovered. Attributes of mentally tough divers were discussed, with additional considerations unique to diving were investigated. Development strategies were discovered. High risk sport concerns were communicated, and advice for neophyte diving coaches was provided.

Data were presented with frequency of responses to add perspective; readers are cautioned against attributing increased value to increased frequency (e.g. general responses are not by nature more effective than variant responses). The responses cannot be perceived as more critical to developing mental toughness without further study. The wide range of responses reflect the individualized nature of defining and developing mental toughness. These findings support the rationalization to use a qualitative methodology to discover those individual differences in as much depth as possible.

The definition of mental toughness, as defined by participants, was similar in many ways to previous definitions of mental toughness (Jones, 2007, 2010). The participants added that masculine characterization of mental toughness, and feeling that divers need to be comfortable outside of their physical or mental comfort zone. A unique finding from the definition that requires further investigation is the idea that toughness may be the incorrect word for what should be labeled a performance ability in diving. The classical connotation of toughness (e.g. the media, traditional masculine sports like football) may be culturally insensitive actually causing some athletes to have difficulty performing in their domain due to an incongruent sense of self.

Further Connaughton et al. (2010) found that pressure in competition was a significant situation that required and developed mental toughness, which was confirmed by the present data. Participants in this study regarded pressure and adverse issues; as being dealt with on a daily basis by divers. Thelwell et al. (2010) conducted research with gymnasts and discovered similar themes around dealing with injuries and fear in training. The previous research did not define what training with injury or recovering from injury; meant to their participants. Although

this fear of injury was a theme in the current research, it may be rooted in a different type of fear. The participants rarely spoke of actual injury, their conceptualization of dealing with injury had to do with the unknown nature of diving.

Participants believed that athletes who knew who they were, and were comfortable with their identity both in sport and in their lives were mentally tough. Identification and acceptance of strengths and weaknesses supports the development of this theme. Participants felt that divers who were mentally tough knew what they were about to do and knew they were going to do it to the best of their ability. Not necessarily that they were going to win, but that there was no doubt in the mentally tough diver's mind that they were capable of performing the skill. The attribute to vividly imagine the entire situation the diver was about to be immersed in was novel in this research. This theme was distinct from knowledge of diving or having no doubts, because the participants specifically mentioned the diver's ability to construct a vivid image in their minds of the skill, the environment, the emotions, the people, the whole picture, and sometimes without previously experiencing that competition situation. The remaining attributes in Table 1 were connected with previous attributes of mental toughness (Driska et al., 2012; Gucciardi et al., 2008; Jones et al., 2007).

Each area of the development strategies found in Figure 2 interacts with the other and in the center is mental toughness development. Research conducted by Driska et al. (2012) with swimmers found similar results: the coach created an environment that would be challenging for the athlete; the athlete developed psychological skills; and the athlete overcame hardship. The challenging environment directly supports the quote presented for providing the diver with difficult situations. The psychological skills the participants in the current research reported

were: increasing confidence, self-awareness, and reframing nervousness. A participant implemented a traditional psychological skills training program for eight weeks with the divers. The psychological skills training is a similar finding from research conducted on gymnasts' development of mental toughness (Thelwell et al., 2010).

Research conducted by Gucciardi et al. (2009) supported many of the findings of the current research: encouraging autonomy, challenging training environment, communication, competition simulation, various support systems, and a positive coach-athlete dyad. The unique development strategies discovered from the participants were: individual differences and acceptance of fear. The participants in the current research were adamant that coaches be aware that each athlete's path to mental toughness may be different.

The acceptance of fear was different than the fear in Thelwell et al.'s (2010) research with gymnasts because the fear was based around injury. In the current research the participants responded that the fear in diving not only includes potential injury, but is constant and always present due to participating in an activity that is contrary to the well-being of humans.

The idea of performing a skill that is not natural was the primary theme developed from the high risk perspective of diving. The current research indicates that coaches need to be aware that divers inherently have these fears and that the fears are natural. Attempts to eliminate these fears may not be an effective way to develop mental toughness in high risk sport domains. The essence of being mentally tough in a high risk domain is being aware of the fear and performing the skill anyway. Performing the skill is more important than any fearful outcome. Many of the skilled movements divers have to perform go against natural ingrained movement principles. This meaning unit was a unique finding present in the high risk sport domain. Being a risk taker

was cited as a reason for participating in diving, but not attributed to attaining an elite level.

These results support the potential of mindfulness based interventions to develop mental toughness in high risk sport athletes. These athletes need to learn how to process the constant level of fear in a nonjudgmental manner (Gardner & Moore, 2004).

Figure 3 provides the results regarding what knowledge these elite coaches would pass onto the next generation of coaches. Participants recommended coaches value each experience they have with divers. Each diver they coached and got to know helped contribute to their knowledge of what mental toughness is and how to effectively develop it in current and future athletes. Concepts that coaches should learn were similar to principles that sport psychology consultants (SPC) can help coaches learn: multicultural concerns, Thorndike's laws of learning (Huber, 2013), attribution theory, and thinking right in sport. Behaviors that develop mental toughness were additional techniques that a SPC could assist coaches in developing. Being an educator not just coach, and building trust with athletes is similar to coaching the whole person, a behavior cited in research with Australian football coaches (Gucciardi, 2009). Integrating humanistic components that participants referenced, being genuine and empathetic, were thought of as paramount by the participants. Learning how to process fear with divers by acknowledgment and acceptance rather than anger and intimidation is a method of developing mental toughness.

Limitations

The participants were familiar with the primary researcher and had a prior relationship when the researcher was a coach. It was determined that in the spirit of qualitative methodology, the researcher would conduct the interviews himself. This allowed for an immersion into the

research environment, and allowed the participants a level of comfort that would have been absent with someone there was no relationship with. Since the subject matter was assessed to be positive in nature it was decided an independent interviewer was not needed. The purpose of the interviews was to get as deep as possible so it was decided that the researcher could do this since the participants knew him and he had a significant amount of knowledge about the sport of diving. Since the participants had a previous relationship with the researcher, it is possible that they could have provided answers to the questions that the researcher wanted to hear. This type of experimenter bias could have happened with an independent interviewer as well. This is a well established limitation of qualitative research (Creswell, 2007). There was no evidence that this happened although it is important to be aware of.

The probing questions may have been limiting by not allowing the participants to go deep enough with some of their explanations. As the interviews progressed the researcher did note that effectiveness of the probing questions increased. The only trustworthiness measure was an external audit for the data. This is a major limitation given the interpretive data analysis tools of the research.

Future Research

Future research could help contribute to the scant body of literature on mental toughness development. Athletes that were coached by the participants could be interviewed, to understand their development of mental toughness, and add triangulation to the data. Diving coaches that are involved at different age and ability levels could be investigated to determine how other groups of coaches develop mental toughness. Elite diving coaches from other countries could be participants to explore the multicultural component of mental toughness. In developing a theory

of mental toughness development, interviewing elite coaches from other sport domains would be beneficial. According to recent literature about the evolution of the winter Olympics, endurance events account for 20% of the Olympic program yet are the focus of at least 80% of the research related to training and performance (Seiler, 2014). A large amount of the Olympic program is now high risk 'extreme' sports. In Sochi there were twenty events in snowboard and free-style skiing, compared with only four in 1994 (Seiler, 2014). An investigation of mental toughness development in high risk environments would significantly contribute to the literature; and growing popularity of high risk sports at the Olympic games. Conducting a case study of developing mental toughness with athletes of a single team would be valuable future research. Intervention development would involve coaches, athletes, and possibly parents.

The development of a quantitative assessment tool may help in developing interventions to enhance mental toughness. The results from this research, integrated with Gucciardi et al. (2009), Thelwell et al. (2010), and Connaughton et al. (2010), and additional qualitative investigations could be used to develop a valid and reliable assessment of developing mental toughness, rooting the theory in several empirical studies instead of relying on anecdotal evidence. With an assessment tool, stakeholders within a sport organization could measure and monitor coaches, athletes, and parents development and maintenance of mental toughness.

An observation protocol inspired by Smith and Smoll's (2011) coaching behavior assessment system (CBAS) would be a valuable direction to take the research on mental toughness development. Working with the coach, a system could be devised of what behaviors the coach perceives as enhancing mental toughness and how the athletes perceive and respond to those behaviors could be tracked. This research could provide coaches with an invaluable view

of how they behave, how their athletes perceive what they are doing, and how the athletes respond to those behaviors (Smith & Smoll, 2011). This type of research may be most appropriate for a performance psychology professional who is employed in a full time capacity in an intercollegiate athletic department setting.

Conclusion

The principle aim of this research was to gain an understanding of how mental toughness is defined and developed in the high risk sport of diving. The results indicated similarities to development of mental toughness in other sports. They additionally revealed that high risk sport has unique areas to focus on to develop mental toughness, such as processing, and acknowledging the obvious fear of the sport. Due to the growing popularity of high risk sports, further research is warranted to develop a theory of mental toughness development of high risk athletes. This information could provide insight into the forces that drive these athletes to take significant risks. Further research is needed to establish effectiveness of mindfulness based interventions with the high risk sporting population. Coaches that mentor athletes in these sports should consider implementing humanistic behaviors that are individualized and build trust in athletes to develop mental toughness in divers.

References

- Castanier, C., Le Scanff, C., & Woodman, T. (2010). Who takes risks in high-risk sports? A typological personality approach. *Research Quarterly for Exercise and Sport*, *81*(4), 478-484.
- Clough, P., Earle, K., & Sewell, D. (2002). Mental toughness: the concept and its measurement. In I. Cockerill (ed.), *Solutions in sport psychology*, (pp. 32-45). London: Thompson
- Connaughton, D., Hanton, S., Jones, G., & Wadey, R. (2008a). Mental toughness research: Key issues in this area. *International Journal of Sport Psychology*, *39*(3), 192-204.
- Connaughton, D., Wadey, R., Hanton, S., & Jones, G. (2008b). The development and maintenance of mental toughness: Perceptions of elite performers. *Journal of Sports Sciences*, *26*(1), 83-95. doi:10.1080/02640410701310958
- Connaughton, D., Hanton, S., & Jones, G. (2010). The development and maintenance of mental toughness in the world's best performers. *The Sport Psychologist*, *24*, 168-193.
- Creswell, J. W. (2007). Five qualitative approaches to inquiry. In *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- Driska, A. P., Kamphoff, C., & Armentrout, S. M. (2012). Elite swimming coaches' perceptions of mental toughness. *The Sport Psychologist*, *26*(2), 186-206.
- Gardner, F. L., & Moore, Z. E. (2004). A mindfulness-acceptance-commitment-based approach to athletic performance enhancement: Theoretical considerations. *Behavior Therapy*, *35*, 707-723.

- Gould, D., Hodge, K., Peterson, K., & Petlichkoff, L. (1987). Psychological foundations of coaching: similarities and differences among intercollegiate wrestling coaches. *The Sport Psychologist, 1*, 293-308.
- Gucciardi, D. F., Gordon, S., & Dimmock, J. A. (2008). Towards an understanding of mental toughness in Australian football. *Journal of Applied Sport Psychology, 20*(3), 261-281. doi: 10.1080/10413200801998556
- Gucciardi, D. F., Gordon, S., Dimmock, J. A., & Mallett, C. J. (2009). Understanding the coach's role in the development of mental toughness: Perspectives of elite Australian football coaches. *Journal of Sports Sciences, 27*(13), 1483-96. doi:10.1080/02640410903150475
- Gucciardi, D. F., Gordon, S. (2011). *Mental toughness in sport: Developments in theory and research*. New York, NY: Routledge.
- Hill, E., Thompson, J., & Williams, N. (1997). A guide to conducting consensual qualitative research. *The Counseling Psychologist, 25*(4), 517-572. doi:10.1177/0011000097254001
- Huber, J. (2013). *Applying educational psychology in coaching athletes*. Champaign, IL: Human Kinetics.
- Jones, G., Hanton, S., & Connaughton, D. (2002). What is this thing called mental toughness? An investigation of elite sport performers. *Journal of Applied Sport Psychology, 14*(3), 205-218. doi:10.1080/10413200290103509
- Jones, G., Hanton, S., & Connaughton, D. (2007). A framework of mental toughness in the world's best performers. *The Sport Psychologist, 21*, 243-264.
- Loehr, J. E. (1986). *Mental toughness training for sports: Achieve athletic excellence*. Lexington, MA: Greene Pres.

- Seiler, S. (2014). Same citius, altius, fortius...More women, crashes, and mctwists? *International Journal of Sports Physiology and Performance*, 9(1), 122-127.
- Smith, R. E., & Smoll, F. L. (2011). Cognitive-behavioral coach training: A translational approach to theory, research, and intervention. In J. Luiselli, & D. Reed (eds.), *Behavioral sport psychology* (pp. 227-248). New York, NY: Springer New York. doi: 10.1007/978-1-4614-0070-7_14
- Thelwell, R. C., Such, B. A., Weston, N. J. V., Such, J. D., & Greenlees, I. A. (2010). Developing mental toughness: Perceptions of elite female gymnasts. *International Journal of Sport and Exercise Psychology*, 8(2), 170-188. doi:10.1080/1612197X.2010.9671941
- Woodman, T., Barlow, M., Bandura, C., Hill, M., Kupciw, D., & Gregor, A. M. (2013). Not all risks are equal: The risk taking inventory for high-risk sports. *Journal of Sport & Exercise Psychology*, 35, 479-492.
- Yeh, J., & Inman, G. (2007). Qualitative data analysis and interpretation in counseling psychology: Strategies for best practices. *The Counseling Psychologist*, 35(3), 369-403. doi:10.1177/0011000006292596

Table 1

Attributes of Mental Toughness

Existing Attributes of Mental Toughness	Attributes specific to diving	Frequency of Response	Supporting Participant Response
Focus	Focus	G	They are just focused on what they are doing
Tough attitude	Being uncomfortable	G	Capability of training outside of their comfort zone. That is the mentally tough kid
Sport intelligence	Knowledge of diving	G	Keep a minimum so if you score 60 points on all your dives you score 360 at this meet which is what she just did. She had a minimum of 340, so you figure out what those dives need to be at 340 and you go from there
	*Awareness of identity	T	The absolute one thing that is most important to great performance, is that you know yourself. You know who you are. You know what you

			strengths are you know your weaknesses and you know how to work around them
Self-Belief	Confidence	T	You are in control of the situation you are not standing there hoping or wishing that it will be good. You know it will be good
	*Distinct Knowing	T	You cannot go down the board wondering what is going to happen. You already need to know.
Psychological skills	Vivid Imagery	V	How vivid of an imagination one has.
	Relaxation	V	Being able to relax
Control of thoughts & feelings	Control	V	Ability to maintain proper control
	Prepared	V	Being prepared, way easier to do well when you are prepared. You are not off kilter, when it is cold out you need to know how to stay warm.
	Trust	V	They trust, a lot of what we have to do is in trust, they trust in me as a coach enough that they will make that correction to better themselves

Handling pressure	Reach potential	AT	Reach their potential faster than the others
	Better competitors	AT	They are better at competitions
Resiliency	Manage anxiety	AT	Focus your attentions to a simple or single cue. Under anxiety cue discrimination becomes more difficult
	Reframe	AT	Knowing how to reframe. When you are going through your event and something happens
Motivation	Daily goals	AT	A part of mental toughness is having everyday goals & work ethic is having, you know again that constant pushing
	High value of sport	AT	Will make any correction, try any dive, because that means more to them than anything that could possibly happen

Note: G=General 6-7 responses, T=Typical 4-5 responses, V=Variant 2-3 responses,

AT=Atypical 1 response

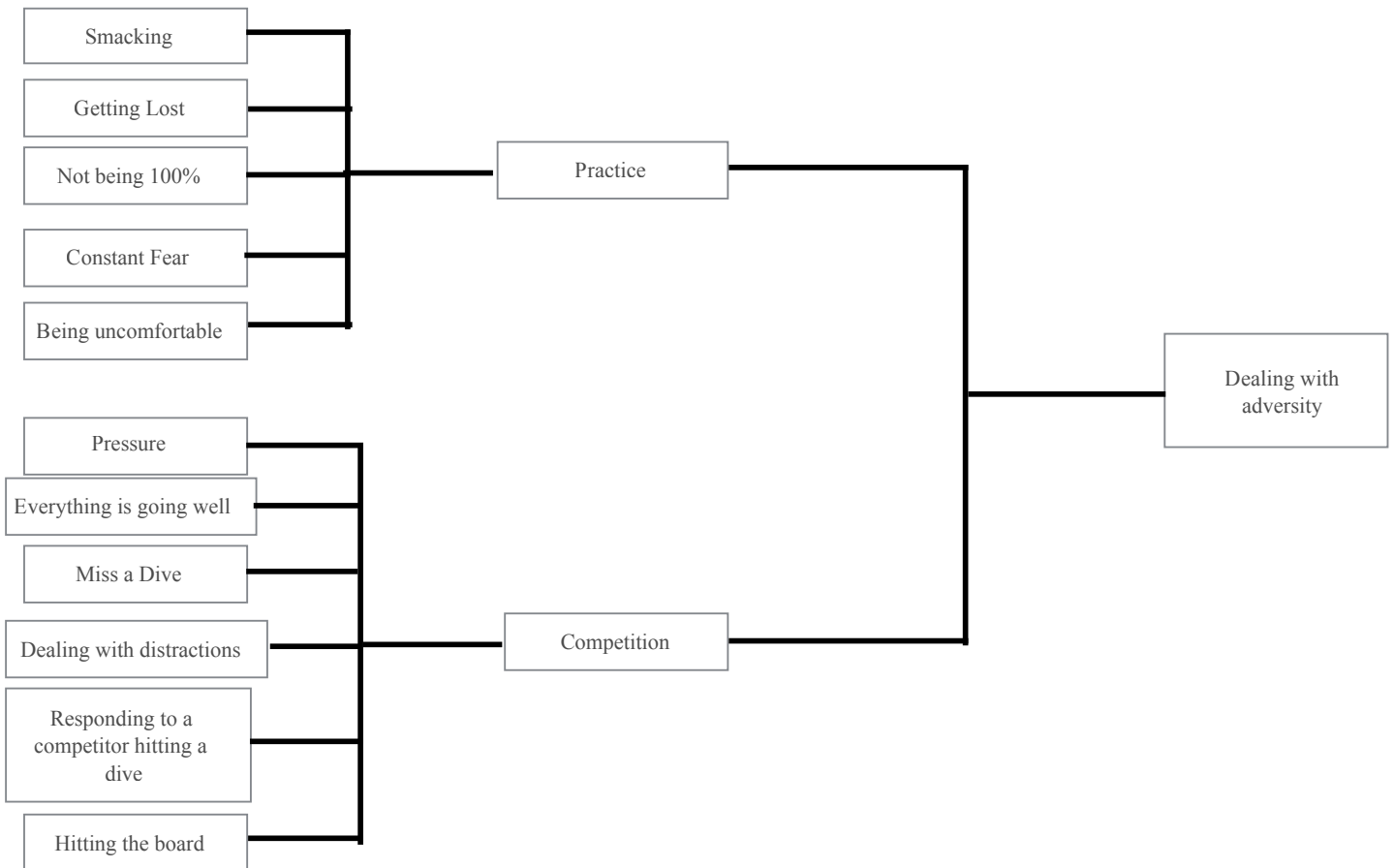


Figure 1. Situations requiring mental toughness as reported by elite diving coaches. Meaning units are combined to form lower order themes, which form the higher order theme of dealing with adversity.

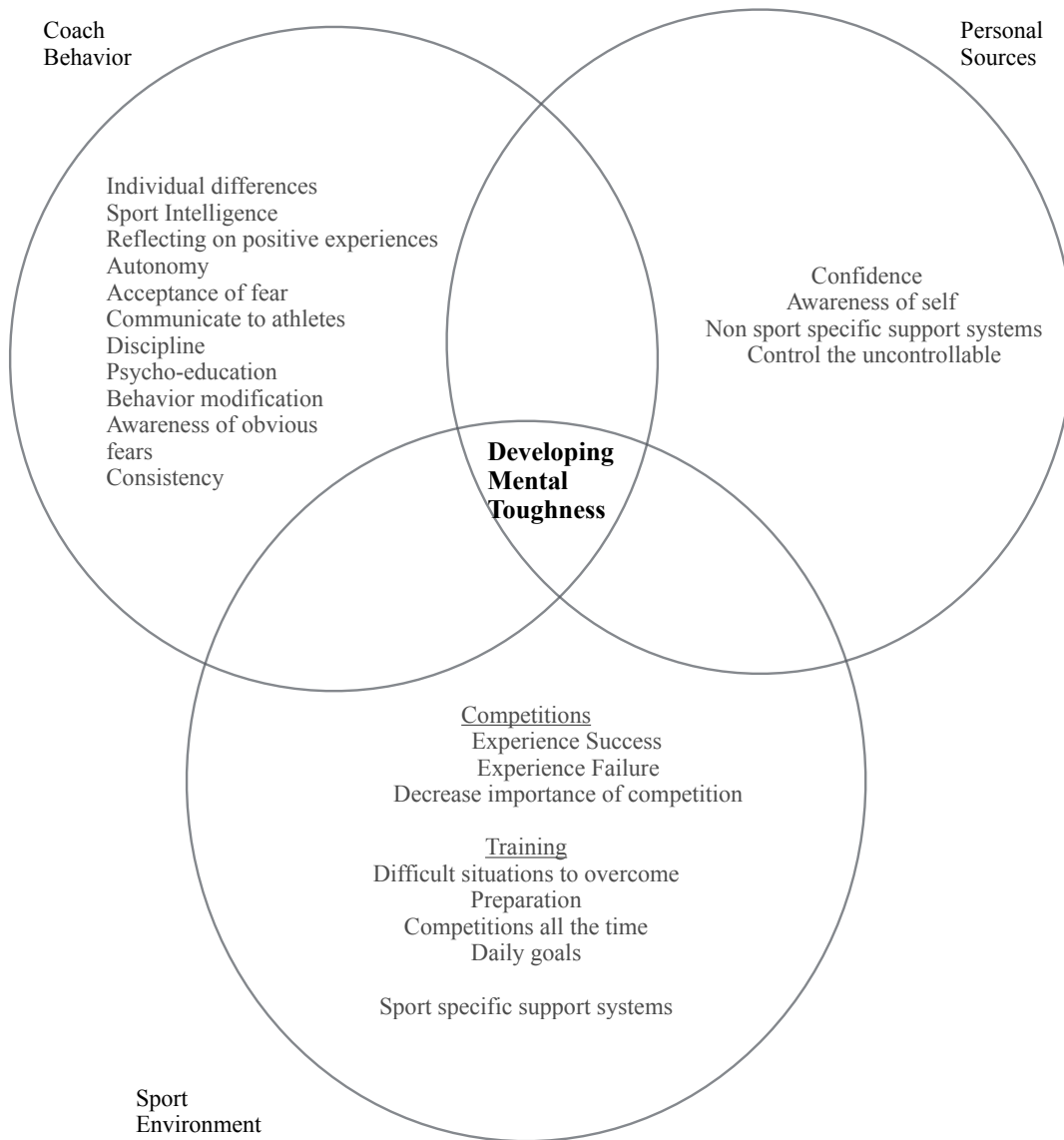


Figure 2. Mental toughness development strategies as expressed by participants. Meaning units are presented, along with lower order themes (when available), grouped in the three higher order themes.

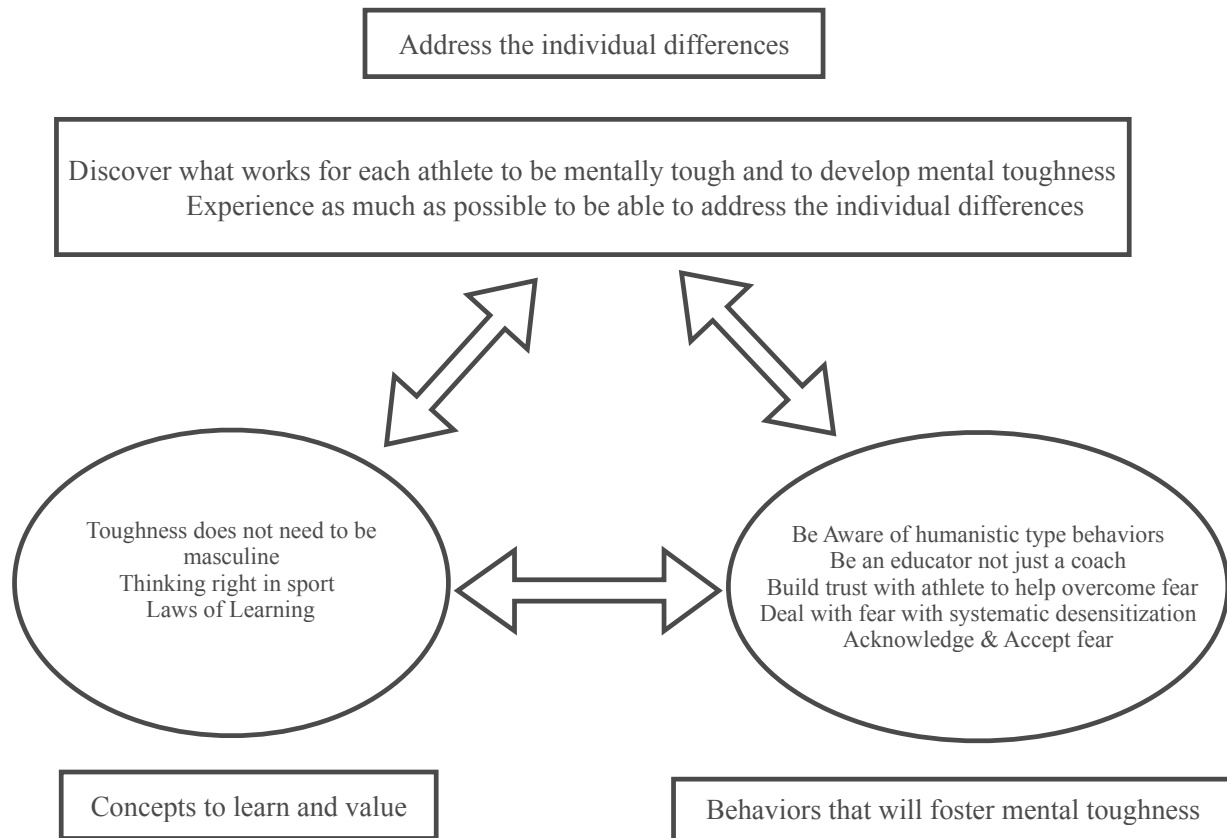


Figure 3. Ideas for Neophyte coaches to develop mental toughness. Responses are grouped into two higher order themes of information for participants to learn, and behaviors coaches can practice to cultivate mental toughness. Overall coaches need to be aware of individual differences constantly.

Appendix A

Interview Guide (adapted from Gucciardi et al., 2009)

1. How would you describe mental toughness in diving?
2. Could you summarize the essence of mental toughness in one or two sentences.
3. What situations in diving do require a diver to be mentally tough?
4. Are there situations in diving that do not require a diver to be mentally tough?
5. What are the attributes of a mentally tough diver?
6. Can you give some examples of this?
7. What are the attributes of a mentally weak diver?
8. Can you give some examples of this?
9. What are some mental toughness attributes that are unique to springboard divers?
10. What are some mental toughness attributes that are unique to platform divers?
11. What are some mental toughness attributes that are unique to male divers?
12. What are some mental toughness attributes that are unique to female divers?

13. Do you think mental toughness can be developed?
14. What ideas do you have for developing mental toughness among divers?
15. What are some of the unique features of mental toughness in diving considering it is a high risk sport?
16. What experiences do you think divers could or should be exposed to that might assist in their development of mental toughness?
17. What attributes of mental toughness are developed at different points during a divers career?
18. What are some strategies that you have used to develop mental toughness with divers you have coached?
19. What ideas do you have that could be used to help design a comprehensive manual for diving coaches on how to enhance mental toughness of their divers?
20. Is there anything else that was not asked that you would like to comment?

Demographic information:

Age:

Ethnicity:

Nationality:

Years coaching diving:

of World champion athletes:

of Olympic athletes:

Highest level you personally attained in your sport (specify if not diving):

Years you participated in your sport: