AN INVESTIGATION INTO COACHING EFFICACY AND EFFECTIVENESS IN GYMNASTICS.

by

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ABSTRACT

Due to the limited research applying the coaching efficacy model (Feltz et al., 1999) to individual sports, this study aimed to examine the relationships between gymnastic coaches' ratings of their coaching efficacy and athletes' perceptions of their coach's effectiveness, including how such perceptions are related to performance outcomes for the gymnasts. Gender differences observed in existing coaching efficacy/effectiveness literature were also examined. Participants were coaches ($N = 16$) and their gymnasts ($N = 109$). Coaches and gymnasts completed revised versions of the Coaching Efficacy Scale (Feltz et al., 1999). Demographic information, coaching efficacy/effectiveness ratings and performance scores were analysed. Results revealed the following: no coaching effectiveness dimension significantly predicted performance; no gender difference existed for game strategy efficacy scores; gender mismatch between coach and gymnast did not predict effectiveness ratings; and overall, coaches rated themselves higher for efficacy than their athletes rated their coach's effectiveness. Results are discussed in relation to the assessment of coaching efficacy/effectiveness in gymnastics, limitations of the current study and differences between gymnastics and other sports previously investigated.

I would like to dedicate this thesis to Sue Brailsford for all her support in its completion.

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CHAPTER I - LITERATURE REVIEW

This literature review aims to define the concepts of coaching efficacy and effectiveness and discuss the relevant literature investigating their importance for the coach and athlete. Gaps in the literature will be identified and the justifications for the current investigation put forward.

Introduction

Coaching efficacy and effectiveness have great importance for optimising the sporting experience for both coach and athlete. Though grounded in the established sport psychology field of Social Cognitive Theory (Bandura 1986), much of the existing literature cannot be generalised to different sporting situations. Coaching efficacy as a concept was developed by Feltz, Chase, Moritz and Sullivan (1999) and was defined as, "The extent to which coaches believe they have the capacity to affect the learning and performance of their athletes". It can be understood as coach specific self efficacy. Much research in the area has focused upon establishing the sources of coaching efficacy and the outcomes which can result from different coaching efficacy levels. More recently research has started to consider the role of the athlete in coaching efficacy. Coaching effectiveness takes into account the athlete's perception of their coach and how this will affect the behaviour and attitudes in which they engage in response to their coach. Research has established how these perceptions are related to outcomes for both the coach and athlete. Much of the research into coaching efficacy and effectiveness has been conducted within team sports. In line with Social Cognitive Theory the environment a coach finds themselves in will affect their own behaviours and emotions as well as their athletes. Therefore findings identified with team sport samples may not be generalisable to the individual sporting environment. A study replicating previous investigations using participants from an individual sport would help address this problem.

Background

Social Cognitive Theory

The behaviours people choose to engage in are directly influenced by their environment and personal factors. To develop new skills, acquire new knowledge or succeed in a task, an individual has to perceive that they can cope with the challenge and situation in which they find themselves. These ideas were drawn together into Social Cognitive Theory by Bandura (1986). His landmark paper identified that through observation cognitive mechanisms bring about changes in behaviour and the ability to deal with challenging situations. The theory centres on the triadic relationship between behaviour, environment and personal cognitive factors. This relationship is termed reciprocal determinism. These factors interact reciprocally; an individual's behaviour is influenced by their environment and their own personal thoughts and cognitions. In turn, their behaviours will have an impact upon the environment they are in and will feed back to affect their thoughts and beliefs. The situation they are in will in turn influence their internal thoughts and ideas (Figure 1).
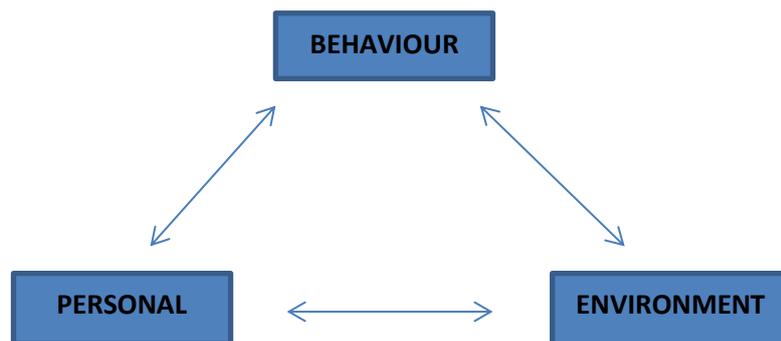
Figure 1. Triad Reciprocal Determinism, (Bandura 1986).

Theory of Self Efficacy

Bandura identified that a key construct within Social Cognitive Theory was the concept of self efficacy. Self efficacy perceptions mediate the reciprocal relationships outlined above as an important consideration under the personal factor. Self efficacy can be defined as a person's belief in his/her capabilities to organise and execute a course of action which would enable him/her to manage prospective situations (Bandura, 1997). A person's perception of his/her self efficacy influences the behaviours in which he/she chooses to partake. Bandura (1997) postulated an individual's level of self efficacy to be influenced and formulated by four general sources of information; performance accomplishments, vicarious experiences, verbal persuasion and emotional arousal. Performance accomplishments are past performance successes or failures and are the most important sources of self efficacy. These are particularly influential because they are based on an individual's own mastery experiences. If performances are generally successful, self efficacy expectations will increase whilst repeated failures will lower expectations. Vicarious experiences involve watching others perform a task successfully which can lead to an increase in one's own self efficacy expectations. Verbal persuasion is when an individual receives positive encouragement from others to increase their self efficacy in a particular task. Verbal persuasion does not have to come from an outside source but can take the form of self persuasion. Stressful situations usually cause emotional arousal that can impact negatively upon perceptions of self efficacy. Physiological factors can be sensed and interpreted as an emotional mood which impacts upon perceptions of self efficacy. Because high arousal usually impairs performance, feelings of anxiety and fear promote a lowered perception of an individual's ability to cope with a situation. The interaction between these four sources of self efficacy and performance in a specific situation are demonstrated in Figure 2.

As demonstrated in Figure 2, the Self Efficacy Theory and its functional model propose that thoughts and feelings, which contribute to self efficacy-perceptions, can be adapted via manipulation of the sources of self efficacy to encourage performance improvement in chosen tasks. This theory has many real world implications. This is exhibited by the many studies in the fields of public health (O'Leary, 1985; Wilson, Wallston and King, 1990), business (Chen, Greene and Crick 1998; Krueger and Dickson, 1994) and education (Zimmerman, 1999), which have identified how influential self efficacy can be in encouraging changes in behaviour and promoting success in achieving goals. The theory has also been readily applied to the sporting context due to its focus on learning/acquiring new skills and performance outcomes. Self Efficacy Theory is extremely relevant to the sporting experience.
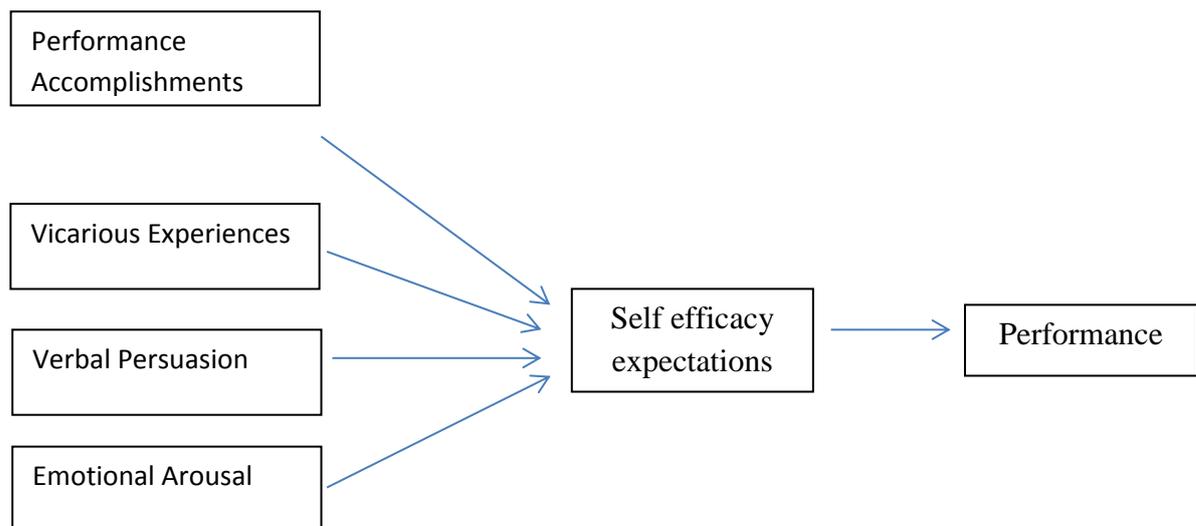
Figure 2. Bandura's Theory of Self Efficacy.

The importance of self efficacy to a sportsperson has been widely investigated (Moritz, Feltz, Farhbach and Mack, 2000). If one considers the situation a person has to cope with is a sporting competition, their training provides opportunities for them to have achieved performance accomplishments, lived through vicarious experiences and also been subjected to

emotional arousal whilst their coach and team mates provide verbal persuasion. This could also be true within the sports skill acquisition stage. Developing and building successful sports skills will depend on the ability to control emotional arousal whilst using a combination of past achievements, experiences and encouragement from one's coach. Sporting success depends upon how a person thinks about and responds to their social (sporting) environment.

This applies not only to an athlete but also to a coach. A coach's ability to cope with a coaching situation is influenced by their past coaching achievements and experiences. It is also influenced by their ability to control their own emotional arousal whilst also providing their athletes with advice on how to control their emotional arousal. An important skill within coaching is the ability to provide verbal persuasion to an athlete to aid their performance and in turn increase their self efficacy. Not only do coaches have their own efficacy levels to consider but they directly influence how their athletes cope in their sporting situation. They are part of the environment which affects their athletes' cognitions and behaviours (Figure 1). This is why Social Cognitive Theory (Bandura 1986) is so suited to research in the field of coaching. It takes into account how the behaviours coaches and athletes engage in are influenced by their own personal attitudes and the demands the sporting environment presents. It also accounts for the reciprocal impact they have upon each other's thoughts, actions and behaviours.

The Model of Coaching Efficacy

The practical applications of Self Efficacy Theory, its links to sport and relevance to coaching explains its important influence in the development of the Model of Coaching Efficacy (Feltz et al. 1999). It is also why coaching specific confidence is looked at as being so important in sporting success. It feeds into the personal variable of reciprocal determinism. In line with

existing research (Moritz et al., 2000) surrounding self efficacy it could be postulated that high levels of coaching efficacy would indicate that a coach is more likely to engage in behaviours that their athletes find helpful in promoting successful sporting performances.

The model of coaching efficacy was initially developed by Feltz and colleagues (Feltz et al., 1999) who defined it as "The extent to which coaches believe they have the capacity to affect the learning and performance of their athletes" (p765). Feltz et al. (1999) identified that even though there had been extensive research into the importance of teaching and managerial efficacy, there had been a lack of investigation into coaching efficacy. They argued that teaching and managerial jobs could be considered to fulfil a similar role as a coach in a different environment. Feltz et al. (1999) identified that sports coaches can be considered teachers as they instruct, provide feedback and promote learning of sporting skills for their athletes. Therefore, coaching efficacy should be considered as important to successful coaching and athletes as teaching efficacy is to successful teaching and school children. They also recognised that though they are related, teaching and coaching efficacy have different influences and components. Therefore findings in teaching efficacy research cannot be generalised to coaching efficacy. It was identified that there was a need for the formulation of a working model to investigate the importance of coaching efficacy in relation to the sporting situation. Feltz et al. (1999) proposed a model consisting of four dimensions that contribute to a coach's total coaching efficacy; motivation efficacy, game strategy efficacy, technique efficacy and character building efficacy. Motivation efficacy is a coach's confidence in his/her ability to affect the psychological state of his/her athletes. Technique efficacy is a coach's confidence in his/her ability to teach athletes the skills and techniques particular to their sport. Game strategy efficacy is a coach's confidence in his/her ability to coach during competitive situations. Character building efficacy is a coach's confidence in his/her ability to

influence the personal development of his/her athletes and promote a positive attitude to sport. They also developed the Coaching Efficacy Scale (CES) to assess coaching efficacy levels. This is a questionnaire which coaches complete themselves which rates their efficacy levels. Feltz et al. (1999) proposed that the level of these four dimensions a coach possesses is influenced by a number of antecedent variables which then lead to various outcome variables. These outcomes can be for the coach's own behaviour and their athletes, as individuals and also as a team. This is demonstrated in Figure 3.

Sources of Coaching   Coaching Efficacy   Outcomes
Efficacy information   Dimensions

Extent of coaching experience/preparation		Coaching behaviour
Prior success (won-lost record)	Game strategy	Player/team satisfaction
	Motivation	Player/team performance
Perceived skill of athletes	Technique	
School/community	Character building	Player/team efficacy
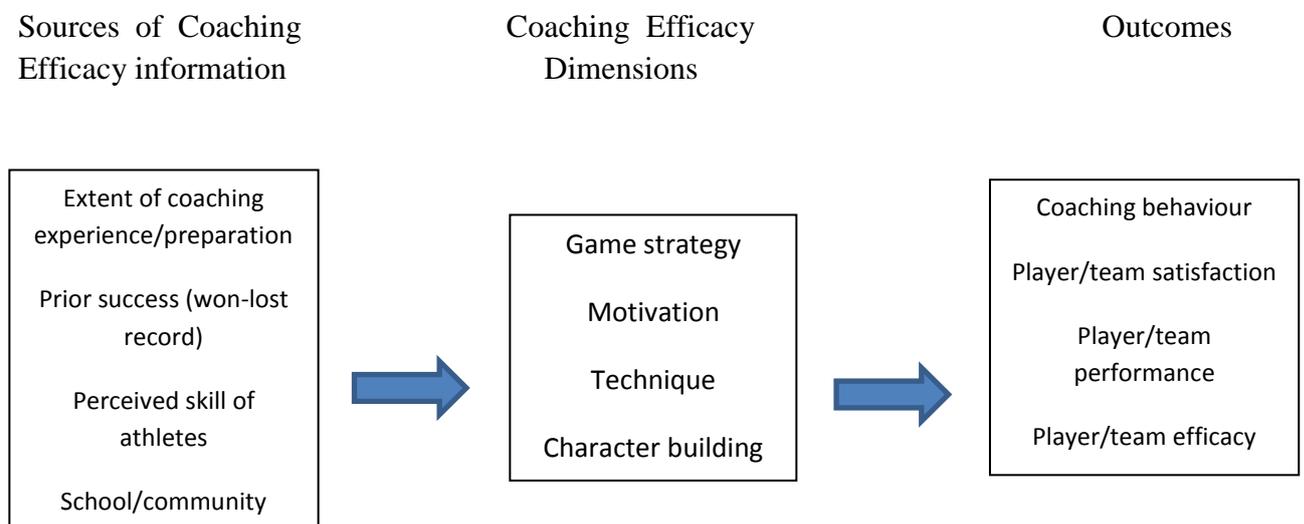
Figure 3. Conceptual Model of Coaching Efficacy, Feltz et al. 1999.

Sources of Coaching Efficacy

To determine the importance of coaching efficacy in the sporting environment much research has focused on establishing the environmental and personal sources which may affect coaching efficacy levels. The initial study by Feltz et al. (1999) investigated 29 basketball coaches on two occasions during a season where they completed the CES. These were split into high and low efficacy groups. It was found that perceived community support was related to all coaching efficacy dimensions except character building. Motivation and game strategy

efficacy correlated with years of coaching and past win/loss record. In addition, motivation efficacy was correlated to perceived team ability.

These findings have since been corroborated by Myers, Vargas-Tonsing and Feltz (2005) who investigated a larger sample (126 coaches and their athletes) with participants from a variety of team sports. Feltz, Hepler Roman and Paiement (2009) conducted similar research within a volunteer youth sport setting, as opposed to the paid high school and college coaches used by Feltz et al. (1999) and Myers et al. (2005). Findings demonstrated that similarly to previous research, coaches with more experience playing and coaching, and who perceived that they received greater social support, were more likely to have higher efficacy levels. Specifically for this coaching group it was found that perceived player improvements over a season and perceived athlete support were significant predictors of coaching efficacy. This study used a large sample of 492 volunteer team sport coaches which strengthens the validity of its findings. The results of this study not only support existing research but also identify specific sources of coaching efficacy for the volunteer youth sport coaching population investigated. This suggests that findings from coaching efficacy research may not necessarily be generalisable to all coaches; the specific sporting situation needs to be taken into account. In line with Social Cognitive Theory (Bandura, 1986) Côté and Gilbert (2009), in a paper drawing together much coaching research, identify that the specific sporting context a coach finds themselves in is one of the most important considerations that informs how a coach functions in their role.

This point is further confirmed by two studies investigating perceived training needs and coaching competencies. Santos, Mesquita, Graça and Rosado (2010) investigated 343 coaches from various sports. Coach perceptions of coaching competencies were related to coaching experience and academic education. Those with low experience were more likely to rate

themselves lower for competency and identify more training needs. Coaches identified they had training needs in the coaching competency areas of; annual and multi-annual planning, practice and competition, and personal and coaching education. Mesquita, Borges, Rosado and Batista (2012) carried out a similar investigation specifically with Portuguese handball coaches. Levels of coaching self efficacy were found to be influenced by coaching experience, education levels and coaching accreditation level. In addition to the training needs identified by Santos et al. (2010) the handball coaches identified management of sport careers and implementation of sports development programmes as coaching competencies they considered needed development. Mesquita et al. (2012) identify these coaching competency training needs as specific to handball as the sport is well established and developed in Portugal. Therefore it is organised to a higher degree than many other sports, including the variety investigated by Santos et al. (2010). Although these studies were not primarily influenced by the Coaching Efficacy Model (Feltz et al., 1999), they do offer support for the model and demonstrate that the confidence a coach has in their abilities is not only affected by variables such as coaching experience or social support but the specific sporting situation (level or sport) in which the coach finds themselves.

Outcomes of Coaching Efficacy

As well as identifying the sources of coaching efficacy, research has also focused on establishing the outcomes coaching efficacy can produce for both coach and athlete. Feltz et al. (1999) identified that coaches with high efficacy had higher winning percentages, more satisfied players and employed more praise and encouragement behaviours than coaches categorised as low efficacy. Again, these finding were supported by Myers et al. (2005). In addition to Feltz and colleagues' (1999) original findings Sullivan and Kent (2003) demonstrated that coaches who were rated as high efficacy engaged in more teaching and

instructional behaviours than coaches with low efficacy as well as providing more positive feedback to their athletes. These coaching behaviours are already established as beneficial to athletes as they promote mastery of skills through training, skills practice and recognising, and rewarding good performances (Chelladurai and Saleh, 1980). The coaches used in Sullivan and Kent's (2003) study also completed the CES and were 224 intercollegiate coaches from a variety of sports. Both team and individual sports, not just basketball coaches as in the Feltz et al. (1999) study. This may explain the finding of links to different coaching behaviours due to the different nature of coaching a team sport compared to an individual sport. Hwang, Feltz and Lee (2013) also investigated the links between leadership style and coaching efficacy. They proposed to examine the relationship between coaching efficacy, leadership style and emotional intelligence (the ability to monitor one's own and others emotions, to analyse them and use them to inform behaviour and cognitions). The theory behind this investigation was that emotional intelligence may influence coaching efficacy levels. This in turn as demonstrated by Feltz et al. (1999) and Sullivan and Kent (2003) would influence the leadership style of the coach. Hwang and colleagues (2013) findings did indeed support this theory. Emotional intelligence of the coaches was shown to directly predict leadership style and coaching efficacy. Further to this, coaching efficacy was shown to mediate the relationship between emotional intelligence and leadership style. This fits with both Bandura's Social Cognitive Theory (1986) and the Model of Coaching Efficacy (Feltz et al., 1999). Emotional intelligence is a personal variable which will affect how a coach can monitor their own emotions. How a coach perceives their ability to do this affects their coaching efficacy level which predicts their behaviours; in this instance, their leadership style. However both the measures for coaching efficacy (CES) and leadership style (Leadership Scale for Sport, Chelladurai and Saleh, 1980) used by Hwang et al. (2013) are sport specific

measures. The measure for emotional intelligence (Modified Version Schutte's Emotional Intelligence Scale, Austin, Saklofske, Huang, & McKenney, 2004) was not. This may raise the question of how relevant the findings of this study and the concept of emotional intelligence are to a sporting situation. With this consideration in mind, Hwang et al. (2013) highlight coaching efficacy as an important mediator between personal variables and behaviours which may be beneficial to both the coach and their athletes.

Vargas-Tonsing, Warners and Feltz (2003) found further benefits for a team that has a coach with high coaching efficacy. Coaches and athletes from 12 American high school volleyball teams participated in the study. Analysis of the results showed that coaching efficacy significantly and positively predicted team efficacy (specific confidence of the individual athletes in the team as a whole) in female volleyball teams. Out of the four coaching efficacy dimensions, motivation and character building efficacy were the strongest predictors of this finding. The existing research discussed above provides support for the findings of Feltz et al. (1999) and the Model of Coaching Efficacy. The most important sources of the four coaching efficacy dimensions and the outcomes different levels of the four dimensions can have on coach behaviour and athlete development have been identified. This confirms the relevance of coaching efficacy research to the sporting environment.

Coaching Effectiveness

Whilst it is important to establish the outcomes of coaching efficacy levels for the coach, ultimately their role is to influence their athletes and promote sporting success. To understand the mechanisms which facilitate the relationships between athlete-related outcomes and differing levels of coaching efficacy research has started to consider the impact of the athlete in the model. How the athlete perceives their coach's efficacy and the impact this has upon

performance outcomes. Côté and Gilbert (2009) suggest that coaching effectiveness is an interaction of a coach's knowledge, athletes' outcomes and coaching contexts. Horn's Model of Coaching Effectiveness (2002) outlines interactions between outside influences, coach attitudes and behaviour, athlete attitudes and behaviour and sporting performance. Horn (2002) proposes that athletes' perception and interpretation of their coach's behaviour influences their perception of their own beliefs. These beliefs and attitudes directly impact upon their sporting performance and behaviour, concepts which are differentiated. Behaviour may not be linked to actual performance. The athlete's perception mediates the effect that the coaching behaviour has upon their own behaviour, which in turn directly affects their performance (Figure 4.)

The personal cognitions of an athlete influence how effective they consider their coach and also the sporting behaviour in which they will engage. Whereas the term coaching efficacy refers to a coach's own belief in their abilities, the term coaching effectiveness can be defined as "The extent to which coaches can implement their knowledge and skills to positively affect the learning and performance of their athletes" (Kavussanu, Boardley, Jutkiewicz, Vincent and Ring, 2008, p. 385). As Horn describes it; "Effective coaching behaviours will vary as a function of the athlete and sport context" (p.244). Just because a coach may have a high coaching efficacy score it does not mean that they are putting this into practice effectively with their athletes or that their athletes perceive them as effective. In Bandura's earlier paper on the Theory of Self-Efficacy (1977) the importance of perception of efficacy levels in influencing performance in a task is highlighted; "Not only can perceived self-efficacy have directive influence on choice of activities and settings, but, through expectations of eventual success, it can affect coping efforts once they are initiated" (p.194). The benefits discussed

previously are not a guaranteed consequence of having a high coaching efficacy score. Environmental and personal considerations affect how far these benefits are achieved.

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│             │                    │    Athletes'     │
│    Coach    │ ─────────────────> │   perception,    │
│  Behaviour  │                    │ interpretation and│
│             │                    │ evaluation of their│
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│  Athletes'  │                    │  Athletes' self- │
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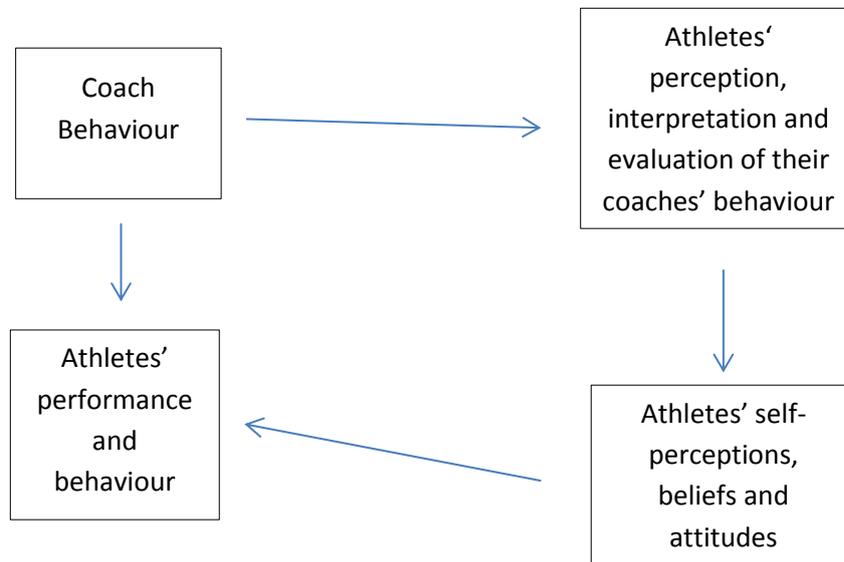
Figure 4. Boxes 5, 6, 8 & 9 of Horns (2002) Model of Coaching Effectiveness.

As identified in Horn's (2002) model, an athlete's perception may be essential in mediating the potential benefit to their performance of a coach with high efficacy. If the link between a successful sporting performance and coaching efficacy is athletes' perceptions of their coach's effectiveness then this should be analysed whenever looking at coaching efficacy and its outcomes for a team or athlete.

Coaching Effectiveness Research

Various studies have moved on to investigate athlete perceptions of coaching effectiveness. Kavussanu and colleagues (2008) investigated athletes' perceptions of their coach's effectiveness. Coaches and athletes from both team sports (basketball, football, hockey, lacrosse, netball, rugby, and volleyball) and individual sports (archery, badminton, fencing, judo, jujitsu, karate, table tennis and trampolining) participated. Findings from the study

showed that sporting experience of the athlete negatively predicted their perception of their coach's effectiveness on all dimensions of coaching efficacy. A mismatch in gender between coach and team resulted in athletes rating their coach lower in motivational and character building effectiveness, a finding previously reported by Myers et al. (2005), in relation to coaching efficacy. The implication of this is that if there is a mismatch of gender between coach and team, a coach may not be able to get the best from their athletes due to potential different instructional/behavioural preferences between males and females (Kavussanu et al., 2008, p399). Male coaches in the sample were shown to have significantly higher game strategy efficacy than the female coaches. Another finding identified was that when comparisons were made between sport types, athletes from individual sports rated their coaches significantly higher in technique effectiveness compared to athletes from team sports. This is a particularly interesting finding as much of the research into coaching has been conducted within a team sport situation. In an individual sport setting a coach would spend much more time working one to one with an athlete, teaching them the techniques and skills of their sport, than in a team sport setting. It raises the question that potentially coaches for individual and team sports use different coaching behaviours to help their athletes achieve success. This is due to the differing nature of their sporting environments. This study primarily investigated variables, such as years experience, that could influence an athlete's perception of their coach's effectiveness. However, differences were found between genders and sport types in relation to coaching efficacy and effectiveness. Although this was not the primary aim of this investigation these findings are interesting and identify factors, which a coach has little control over, that may impact upon levels of coaching efficacy, effectiveness and performance success.

The results from Kavussanu et al. (2008) demonstrated that more experienced athletes rated their coaches lower for effectiveness. Coaches also rated themselves significantly higher in efficacy than their athletes rated them in effectiveness. This result is consistent with an earlier study by Short and Short (2004) who compared coaching efficacy scores with athlete perceptions of coaching efficacy in American football teams. Short and Short (2004) do not use the term coaching effectiveness or competency in relation to athlete perceptions. Instead they apply coaching efficacy to the athlete point of view. Out of nine coaches who participated in the study seven reported a higher total coaching efficacy rating than the mean perceived rating their team reported. Both Kavussanu et al. (2008) and Short and Short (2004) identify that coaches tend to report a higher coach efficacy score than their athletes rate them for coaching efficacy/effectiveness. This suggests that this relationship is a trend that may be generalisable to the wider coaching community. The findings further highlight that coaching efficacy levels do not necessarily transfer to athletes. Consideration of the athlete perception of the coach is also needed. Further exploration of the relationship between athlete and coach ratings in different sports may need to be performed for clearer understanding of this issue.

Boardley, Kavussanu and Ring (2008) examined athletes' perceptions of coaching effectiveness dimensions as a predictor of various player outcomes in rugby union. Results identified perceptions of motivation effectiveness positively predicted player effort, commitment, and enjoyment. Athlete perceptions of technique effectiveness predicted player task, self-efficacy and perceived character building effectiveness predicted pro-social behaviours within athletes. These results highlight the positive relationship that exists between athletes' perceptions of coaching effectiveness and performance outcomes for themselves. If they perceive their coach to be high in effectiveness they are more likely to engage in and demonstrate qualities that will aid and enhance their own performance

attempts. This study helps to confirm the Model of Coaching Efficacy (Feltz et al., 1999) and demonstrates the link between an athlete's perception of their coach's effectiveness and the positive outcomes that can result. As identified by Boardley et al. (2008), if athletes perceive their coach to be more effective this may encourage them to be more committed and make more effort within their sport. This in turn should give them a greater chance of a positive sporting experience and potential to achieve a better performance through an increase in vicarious experiences and performance accomplishments. Many of these findings can be compared to results identified in Feltz et al.'s (1999) initial study. Feltz and colleagues (1999) found that higher efficacy coaches had more satisfied players. Boardley et al.'s (2008) findings identify improvements in self efficacy, effort, commitment and therefore enjoyment for an athlete is mediated by the perception of coaching effectiveness held by the athlete. That these studies have supporting findings lends validation to the initial Feltz et al. (1999) study. This study also highlights the importance of assessing each dimension of coaching efficacy/effectiveness separately. Each dimension was shown to be related to different outcome variables. To optimise the benefit to athletes all four dimensions need to be considered as separate variables. Total coaching efficacy analysis may not provide a full understanding of the relationships between coaching efficacy, athlete perceptions and beneficial cognitive outcomes.

Myers, Feltz, Maier, Wolfe and Reckase (2006) investigated athletes' evaluations of their coach's competency. Coaching competency is similar to coaching efficacy but was defined by Myers and colleagues (2006) as "athletes' evaluations of their head coach's ability to affect their learning and performance" (Myers et al., 2006, p.113). Boardley et al. (2008) identify the difference between the two constructs, "effectiveness is concerned with the outcomes or results one produces, whereas competence pertains to the skills one has" (p271). However,

because both terms relate to the athletes' perception of their coach, the findings from Myers et al. (2006) have a bearing on coaching effectiveness research, especially if outcomes are not under investigation. Myers and colleagues' (2006) participants included athletes from American soccer and hockey teams and their coaches. The authors of this study identify that athletes' perceptions of their coach's competency levels are both multidimensional and multi-level. By this they mean athlete perceptions are not influenced only by total coaching competency but by the four dimensions; motivation, game strategy, technique and character building. They are also relevant for the individual athlete and for the athletes grouped within a team. Myers et al. (2006) surmised that the athletes' response to the scale is mediated by their coach's level of coaching competency. The behaviour of the coach directly affects how his/her athletes perceive that behaviour.

In a further investigation into coaching competency, Myers, Beauchamp and Chase (2011) assessed if athlete perceptions of coaching competency could predict satisfaction with their head coach. 748 athletes from 74 teams provided data rating their head coach's coaching competency in the four coaching efficacy dimensions, total competency and the satisfaction they felt with their head coach. Motivation and technique competency were shown to significantly positively predict athlete satisfaction. 51.8% of the variance in athlete satisfaction was explained by motivation and technique competency levels. 88.3% of the variance in team satisfaction was due to coaching competency. Team perceptions of the head coach's total competency positively predicted team satisfaction. That motivation and technique competency were significant predictors of athlete satisfaction makes conceptual sense. These dimensions concern both the psychological and physical skills a coach needs to promote in their athletes to so that they can achieve success and feel satisfied in their sport. The strength of this study is that a direct link between team/athlete perceptions and the

positive outcome of team/athlete satisfaction is identified. The importance of taking the athlete perception into account is highlighted. This is not only important at an individual level but also at the team level. The findings of Myers et al. (2011) demonstrate how the athlete's perception of their coach's competency can influence their thoughts and attitudes. The importance of measuring athlete perceptions of coaching competency alongside coaching competency is identified as important in understanding the outcomes that can occur for the athlete, as individuals or as a team. Coaching competency, athlete perceptions and athlete outcomes are all interrelated and need to be assessed together. Myers et al. (2011) recommend that there is a need for much more research into athlete perceptions and the influence this may have on their attitudes, beliefs and therefore overall performance.

The importance of athletes' perception of their coach's effectiveness and how this affects their own behaviour has been shown to not only have positive outcomes. Chow, Murray and Feltz (2009) investigated how a coach's efficacy levels can influence their team norms for aggressive behaviour and players likelihood to aggress, both variables that are considered detrimental to effective performance. A positive relationship was identified between a coach's game strategy efficacy and a player's likelihood to aggress. Chow et al. (2009) also found game strategy efficacy was related to the experience of the players, the team norms for aggression, and the playing and coaching experience of the coach, as identified previously by Feltz et al. (1999). Game strategy efficacy regards making critical decisions at competition to maximise a team's strengths and exploit the opposition's weakness. Coaches with a high level of game strategy efficacy may promote aggressive or impulsive behaviours to overcome a challenging competitive situation in order to win. By following Horn's model (2002) it could be suggested that how an athlete perceives this may lead them to engage in antisocial behaviours like cheating. This could ultimately be detrimental to performance as they may be

sent off or punished for unsportsmanlike actions. This could cause negative personal feelings and attitudes or make the competitive challenge greater for the rest of the team. All this will feedback to influence future behaviour of the player and coach. The findings of Chow et al. (2009) highlight that negative behaviours can be the consequence of differing levels of coaching efficacy. The findings of Chow et al. (2009) are in contrast to results from Boardley et al. (2008) who found no relationship between antisocial behaviours and rugby player perceptions of their coach's coaching effectiveness for any dimension. As already discussed they did find a positive relationship between pro-social behaviours and character building effectiveness. Neither study measured both coaching efficacy and effectiveness and they were conducted with different athlete groups. Chow et al. (2009) used youth soccer players and Boardley et al. (2008) used adult rugby players. The disparity between these two studies formed the rationale for Malete, Chow and Feltz (2013) to conduct a study into coaching efficacy and coaching competency perceptions on athlete moral variables in youth soccer. Malete et al. (2013) investigated 506 youth soccer players in Botswana and their 24 head coaches. Coaching efficacy, coaching competency (same concept as used in Myers et al., 2006) and various team and individual moral variables were measured. Results indicated athletes' perceptions of their coach's endorsement of aggressive and cheating behaviours had a strong positive relationship with their likelihood to engage in antisocial behaviours. Team norms for aggressive/cheating behaviour predicted athlete likelihood to cheat and engage in aggressive behaviour. This was supported by perceptions of game strategy competency positively predicting athlete anti-social behaviour. Although this study by Malete et al. (2013) does succeed in offering supporting evidence for the Chow et al. (2009) study whilst considering both coaching efficacy and competency perceptions, the instrumentation, (use of the Judgements About Moral Behaviour in Youth Sports Questionnaire, Stephens,

Breidemeier and Shields, 1997), and sample used is similar in both studies. It is also still in contrast to Boardley et al. (2008). Therefore the differences in findings are still not addressed or explained. Further investigation is needed. The studies discussed above raise practical considerations for coaches. They need to be aware that how their athletes perceive their effectiveness may influence the behaviours in which they engage not only in a positive but also in a negative way. This in turn could have a negative impact on their sporting performance. Coaches may need to consider altering their own behaviour to help improve their athletes' success. Studies have proved the beneficial effect of intervention programmes aiming to improve coaches levels of coaching efficacy (Malete and Feltz, 2000) and the beneficial effect this has for various outcome variables for the athlete (Harwood, 2008). Coach awareness and understanding of the effect their own efficacy level can have is important to ensure the optimal enjoyment and success for the individual athlete.

Limitations of Existing Research

As highlighted by the existing research already discussed, coaching efficacy and coaching effectiveness are important factors that can lead to many positive variables which can aid an athlete in their sporting success and enjoyment. What is lacking in this area is research that measures performance as an outcome of coaching efficacy or effectiveness. Horn's model (2002) distinguishes between the athlete's behaviour and performance. Much of the existing research already discussed has observed behavioural outcomes for the coach or athlete which will aid a successful performance. Behaviours may influence how successful a performance can be but are not necessarily a measure of a successful performance. For many, the success of the physical performance is the ultimate sporting goal, not just the associated satisfaction or positive psychological variables that sporting experiences can bring. As discussed earlier in line with Bandura's Theory of Self-Efficacy (1997), previous successes can influence the

coaching efficacy level of a coach or how an athlete perceives their coach's effectiveness. Potentially the performance and coaching efficacy/effectiveness levels influence each other in a reciprocal fashion. A successful performance may feedback to increase a coach's efficacy levels. This in turn will be perceived by the athlete and may influence their behaviours and attitudes which will have an effect upon their performance. The perception of coaching effectiveness is the mediating factor between coaching efficacy and performance. Investigating the links between coaching effectiveness and performance may lead to a greater understanding of the influence of coaching effectiveness in sport.

The other major limitation within the area of coaching efficacy/effectiveness is the predominance of participants from team sports as opposed to individual sports. Differences have been found previously in the sources of coaching efficacy for coaches of volunteer youth sport compared to college (professional) coaches (Feltz et al., 2009). Also, as discussed previously, differences have been found between different coaching groups in relation to promotion of antisocial behaviours (Boardley et al., 2008; Malete et al., 2013). This demonstrates different sporting environments offer different challenges to coaches. The differing sporting environments of individual versus team sport may produce different demands and elicit different behaviours from coaches. In the few studies already mentioned that have used participants from individual sports it has been identified they report different responses than participants from team sports, (Kavussanu et al., 2008; Sullivan and Kent, 2003). Training and competing as an individual as opposed to part of a team presents different pressures and unique challenges. For athletes who partake in individual sports their coach is their primary source of external feedback during a performance due to an absence of team mates. They have to rely upon their own judgement combined with their coach's feedback to influence any changes they need to make to a performance. Gymnastics is a very popular

individual sport which has many different situational demands to most team sports. Gymnasts perform complex and potentially dangerous skills so the role of a coach is particularly important due to the physical support they provide during skill acquisition. How a gymnast perceives their coach is directly going to affect how confident they are to try and perfect these gymnastics skills. Even beyond skill acquisition gymnasts have to have confidence in their coach as miniscule technical alterations from the coach, which the gymnast may not be able to sense themselves, can be the difference between success and failure or even potential injury (Chase, Magyar and Drake, 2005). As success in gymnastics is not only measured in terms of difficulty but also aesthetic quality, the considerations of a gymnast to achieve a successful performance are varied and intense. The role of a coach to optimise these performances is extremely important. The importance of understanding spatial and temporal characteristics of a skill has been found specifically to be extremely important in skill acquisition for gymnastic coaches (Irwin, Hanton and Kerwin, 2005). This has been corroborated by Dowdell (2010) who identified the characteristics of effective gymnastics coaching. He identified that monitoring students and inter-personal communication skills were also important aspects of good gymnastics coaching. Because of the lack of any coaching efficacy/effectiveness investigation solely with participants from an individual sport, even less from gymnastics which has its own specific coaching demands, a study looking into these two variables with gymnasts and their coaches would further the understanding of coaching efficacy/effectiveness as a whole.

Aims of Current Study

The aims of the current study were to investigate the relationships between gymnastic coaches' ratings of their coaching efficacy and athletes' perceptions of their coach's effectiveness, including how such perceptions are related to performance outcomes for the

gymnasts. Mismatch between gender of coach and athlete are also explored within the investigation. These relationships feed directly into the factors of reciprocal determinism in Social Cognitive Theory (Bandura 1986). Gymnastics is the specific sporting environment, coaching efficacy/effectiveness the personal variable and performance the consequence of behavioural outcomes. Because of the limited existing coaching efficacy research into individual sports, particularly gymnastics, this study aimed to investigate coaching efficacy and effectiveness within a gymnastic environment. Existing research regarding differences in responses due to gender and mismatch between coach and athlete (Kavussanu et al., 2008) have been identified which have not been investigated in a study focusing entirely on individual sports. By investigating trends in an individual sport setting that have already been established in research with team sport participants, a more comprehensive understanding of predictors, outcomes and relationships in coaching efficacy/effectiveness can be achieved. This will not only identify potential new findings but help to consolidate existing knowledge concerning coaching efficacy and effectiveness.

Hypotheses

Four main hypotheses were proposed and tested. First, that athletes' perceptions of their coach's effectiveness would positively predict athletes' competitive performances, a finding not investigated previously, although studies exist identifying positive relationships with variables that are beneficial to performance (Vargas-Tonsing, Myers and Feltz, 2004; Sullivan and Kent, 2003). The second hypothesis is that gender differences in coaching efficacy would exist with male coaches rating themselves higher than female coaches for game strategy efficacy as identified by Kavussanu et al. (2008). Third, that athletes coached by coaches of the same sex would rate their coach higher for effectiveness than those coached by a coach of the opposite sex, again a finding from Kavussanu et al. (2008). Finally, that coaches' ratings

of their coaching efficacy will be higher than their athletes' ratings of coaching effectiveness for all four dimensions of coaching efficacy/effectiveness as identified by Short and Short (2004) and also Kavussanu et al. (2008), whose participants included athletes from individual sports.

CHAPTER II - METHOD

With the development of the Model of Coaching Efficacy (Feltz et al. 1999) came the development of the Coaching Efficacy Scale (CES). The CES or measures derived from the CES have been used in the majority of coaching efficacy/effectiveness/competency research. The CES and a modified version, which will assess coaching effectiveness, are the main measures used in the current investigation.

CES: The CES, (Feltz et al., 1999) was used to assess coaches' perceptions of their coaching efficacy. The questionnaire is made up of 24 items which relate to the four different coaching efficacy dimensions; 7 for motivation, 7 for game strategy, 6 for technique and 4 for character building. The stem for the questionnaire is "How confident are you in your ability to ….?" and uses a rating scale ranging from 0 (*no confidence*) to 9 (*extremely confident*). In their original study Feltz et al. (1999) conducted an Exploratory Factor Analysis which suggested that there was a four factor structure made up of 24 items. These items were shown to load highly onto the factor they were designed to measure. Also the correlations between the four factors which made up the CES may lead to a second order factor of general Coaching Efficacy. This pattern was investigated and confirmed via Confirmatory Factor Analysis. Feltz et al. (1999) tested the reliability of the CES via coefficient alpha and test-retest analysis. The test-retest coefficients reported were .77 for character building, .78 for technique, .83 for motivation, .84 for game strategy and .82 for the total CES. The coefficient alpha results reported were .88 for character building, .89 for technique, .91 for motivation, .88 for game strategy and .95 for the total CES. These results identify the CES as a reliable measure for assessing coaching efficacy.

Modified CES: In their investigations into coaching effectiveness, Boardley et al. (2008) and Kavussanu et al. (2008) used a modified version of the CES to gauge athletes' perceptions of

the effectiveness of their coach. The stem for the items was "How effective is your coach in his/her ability to…?" The same items were included as in the CES, only reworded to be applicable to athletes, not coaches e.g. "build the self-esteem of your athletes" becomes "build the self-esteem of his/her athletes". In the Boardley et al. (2008) study, Confirmatory Factor Analysis utilising the 24 items failed to achieve an acceptable level of fit. Therefore, one item "how effective is your coach in his/her ability to mentally prepare his athletes for game strategies" was removed from the scale. Removal of this item achieved an acceptable fit. This item had already been highlighted in the original Feltz et al. (1999) study as loading highly onto both motivation and game strategy dimensions but it was decided it should be retained due to removal not substantially improving fit statistics. Kavussanu et al. (2008) also conducted Confirmatory Factor Analysis with the modified CES but found acceptable levels of fit using all 24 items. Kavussanu et al. (2008), after performing Confirmatory Factor Analysis, concluded that the four first order variables jointly measure a second order variable of Total Coaching Effectiveness. In both of these studies the modified CES was identified as a valid measure of athletes' perceptions of their coach's effectiveness.

There were several considerations that needed to be taken into account in order to apply the CES and modified CES to a gymnastics environment. As identified by Boardley et al. (2008), the four coaching efficacy dimension were shown to be related to different outcome variables. Because the current investigation aimed to investigate the outcome variable of performance each coaching efficacy dimension needed to be considered separately as each dimension could potentially have a different relationship with performance in gymnastics. Therefore all four dimensions and total coaching efficacy/effectiveness were measured. The technique and motivation efficacy dimensions are readily applicable to gymnastics and relevant to performance. However game strategy and character building are not as easily transferable.

With the absence of team mates or direct contact with opposition gymnasts the importance of the character building dimensions can be questioned. However, in a paper aiming to define the concept of coaching effectiveness, Cote and Gilbert (2009) argue that the athlete outcomes from coaching effectiveness can be classified under 4 C'S; competence, confidence, connection and character. Connection and character are related to the character building dimension. Connection refers to athletes developing "Positive bonds and social relationships with people inside and outside of sport" (Cote and Gilbert, 2009, p. 314). Character is the "Respect for the sport and others (morality), integrity, empathy and responsibility" (Cote and Gilbert, 2009, p. 314) that athletes learn from effective coaches. If an athlete demonstrates responsible behaviour, respect and positive relationships with others they are less likely to engage in negative or aggressive behaviours. Negative or aggressive behaviours displayed by a gymnast could disrupt their own or other gymnasts mental preparation in training and competition. Due to the focus needed for gymnastic skills this could lead to an impaired performance and potentially dangerous accidents. As acknowledged by McIntosh (2014) gymnastics requires concentration and any negative thoughts can distract a gymnast and lead to performance failures. Aggression and over arousal would lead to less physical control and focus. If a coach promotes character building qualities in their gymnasts they are potentially removing negative personal distractions which could cause lack of concentration and unsuccessful performances.

The concept of game strategy is different in gymnastics compared to team sports. This dimension specifically encompasses the ability of a coach to think quickly in response to opposition performances, environmental factors and develop team tactics during competition. Gymnastic skills are closed as opposed to open so a gymnastics coach will not start changing routines at competition depending on opponents' performances as in team sports. Gymnasts

prepare routines for many months before competing; as such, changing these routines during competition would likely be detrimental to performance. During competition the role of a gymnastics coach is to provide feedback to a gymnast in order for them to fully concentrate and technically compete at their best.

Due to the considerations discussed and because the CES has primarily been used within a team sport setting, various changes were needed before the questionnaire could be used within a gymnastic environment. The changes made to the CES items were made by myself, the primary researcher with gymnastic coaching experience, with guidance and advice from experienced sport science researchers. The majority of changes were made to the game strategy items. For some items the word team was replaced with athlete. It was decided that the items referring to opposing teams' strengths and weaknesses should be combined into one item. Gymnastic performances do not depend upon opponents, though modelling and observing other gymnasts can be a useful tool for coaches. "Understand competitive strategies" was altered because strategies are not used in gymnastic competitions. The challenge is more about dealing with a pressure situation whilst performing highly complex potentially dangerous skills and routines. "Make critical decisions during competition" is not a demand placed upon gymnastic coaches; their primary role is to provide feedback after each performance. The changes made to items are shown in Table 1.

In addition to the changes listed in Table 1. The motivation item "Mentally prepare athletes for game/meet strategies" was changed to "During competition prepare your athletes for their performance". This was because it was considered that gymnasts tend not to have strategies or tactics for a competition, but that coaches prepare their gymnasts by optimising their psychological state. This item has been highlighted as a problem before in the existing literature as it can load onto both the motivation and game strategy subscales. Researchers

have dealt with this issue in different ways. Some decided it should remain within the scale (Feltz et al., 1999; Myers et al., 2006) whilst others (Boardley et al., 2008) have removed it to improve the validity of the scale. The decision was taken that because the item had been modified to be used within the gymnastic environment it should be retained as similar problems could not be confirmed unless the item was used with participants. Any issues could be explored in further investigations. Due to the merging of two game strategy items the modified gymnastic version of the CES contained 23 items. Before the questionnaire could be used in a full scale investigation a pilot trial of the questionnaire was needed. This would ascertain if the newly created items and the measure in general were suitable for use with gymnasts and coaches.

Original CES game strategy item.	Adjusted item.
Recognise opposing team's strengths during competition	Use other athletes' performances during competition to develop your own athletes
Recognise opposing team's weaknesses during competition	
Understand competitive strategies	Understand the demands of competitive situations
Adapt to different game situations	Adapt to different competitive situations
Make critical decisions during competition	Provide performance feedback during competition
Maximise your team's strengths during competition	Maximise athletes' strengths during competition
Adjust game strategies to fit your team's talents	Develop competitive routines to suit an athlete's abilities

Table 1. Changes made to Game Strategy Items.

Pilot Study

The aim of the pilot study was to administer a gymnastic specific version of the CES (Feltz et al., 1999) and modified CES (Boardley et al., 2008) to gymnasts and their coaches, assessing their responses to the measure, particularly how relevant the items were to gymnastics. There were 10 participants for the pilot study, 5 coaches and 5 gymnasts. The gymnasts' ages ranged from 20-22 years with an average of 20.6 years, and the coaches' ages ranged from 20 to 49

years with an average age of 32.2 years. The average numbers of years spent coaching for the coaches was 14.4. The average number of years of gymnastic experience for the athletes was 12.6. Both groups included 2 males and 3 females. Participants were contacted via email through contacts known to the researcher. Respondents were emailed the relevant (coach or athlete) questionnaire pack which contained the revised CES as well as a demographics section and asked to return the completed pack giving feedback to the clarity of wording and the relevance of the items to gymnastics. The questionnaire pack also included an information sheet which gave a brief description of the study aims, the name of the researcher to discuss any queries with and it also made it clear that the participants could withdraw their consent at any time and their responses would be destroyed if they did so. If participants wanted to indicate their informed consent to take part in the pilot study they completed a consent form. Full ethical approval was given for this pilot study by the University of Birmingham Ethics Committee.

The clarity and relevance of the items of the questionnaire was said to be good by all participants apart for one item. The item "Demonstrate the skills of your sport" was identified as having clarity issues. The pilot study participants who raised the issue suggested this item implied you would personally demonstrate the skills which may not still be possible for all coaches. They commented that they generally used other methods to demonstrate technique to their gymnasts as they no longer had the skills to carry them out personally. This item was reconsidered and changed to "Perform or arrange demonstrations of the skills of your sport". The responses to the questionnaire suggested no problems with completion of the scale as none of the items were routinely left out. As a result, no further alterations were made to the questionnaire.

The pilot data indicated few participants responded using the lower end of the response options. Only six times were responses in the lowest five rating responses used; 0-1, 1-0, 2-3, 3-0, 4-2. A similar trend has been previously reported by Myers, Feltz and Wolfe (2008), who recommended a four or five category rating response (depending on the coaching population) for the CES due to the limited use of the lower ratings. However, even though the lower end of the rating scale was rarely used by the pilot study sample in a larger scale study there may be more participants who wish to use these lower ratings due to inexperience or coaching/competitive level. To take into account all potential participants the decision was taken to retain a 10-item rating scale for the initial investigation.

Main Study

Participants

125 participants volunteered to take part in the study, incorporating 16 coaches and 109 gymnasts. The gymnasts' ages ranged from 16 to 30 years old with a mean average of 19.79 years, and the coaches' ages ranged from 20 to 51 years old with a mean average age of 25.06 years. The average number of years spent coaching for the sample was 8.91. The average number of years gymnastic experience for the athletes was 10.26. The gender split between the groups was 11 male and 5 female coaches and 30 male and 79 female gymnasts. All of the coaches had previously been gymnasts and 7 coaches identified themselves as full-time gymnastic coaches. The coaches also identified the level they currently coach at; two at recreational level, three at club level, four at university level, three at regional level and four at international level. The current competitive level of the gymnasts was identified; 11 recreational, 73 club, five county, 14 regional and six international. The highest level

gymnasts had competed at was; seven recreational, 22 club, 18 county, 49 regional and 13 international. 103 identified themselves as University team gymnasts.

Measures

The measures used in this study were the two adapted versions of the CES described above. Performance was measured using judges' scores from competition immediately following questionnaire completion for all gymnasts. This is the most appropriate method to establish a performance score as an overall numerical score is generated for each gymnast in relation to performance success.

Procedure

Gymnastics club captains and coaches were contacted via email in relation to taking part in the study. Captains and coaches were identified from University websites or through the British Gymnastics website. They were asked if their clubs were competing at any upcoming events and would be interested in taking part in the study. The study was explained as involving a short questionnaire that needed to be completed during the week before a competition. Competition scores were collected after the competition had taken place through official websites or by contacting event organisers. The full questionnaire pack comprised of an information sheet, consent form, demographic information form and the relevant version of the CES. The information sheet gave a brief outline of the study and it was made clear that participants could withdraw at any time and their data would be destroyed. If participants felt they wanted to take part given the information they had been presented with they completed the consent form. Gymnasts younger than 16 years old were asked to obtain parental consent to participate in the study. Those gymnasts over 16 years old consented themselves, as did the coaches.

Once captains and coaches had agreed to participate, a date was agreed for data collection to be completed. This was at a training session within the week before a competition. Questionnaires were completed during the warm up phase of the session so that coaches and gymnasts could complete the questionnaire without disrupting the actual training. Data collection was monitored so that gymnasts and coaches filled in their questionnaires separately to avoid influencing each other's responses. Once questionnaires were completed and returned they were assigned a code to link coaches to their gymnasts for data inputting purposes and to preserve anonymity. For two clubs it was not possible to collect data in person. These clubs were initially contacted in the same manner but when a suitable collection date could not be agreed questionnaire packs were posted or emailed to the coaches and captains to distribute to their clubs. Pre-paid, self-addressed envelopes were included with posted questionnaires to ensure ease of return and as little inconvenience to the participants as possible. Instructions were given with both the emailed and posted packs, explaining that the questionnaires had to be completed during the week before competition. This ensured all participants completed their questionnaires within a similar time frame. Courtesy emails were sent on the days the questionnaires were sent out, the day before the completion and the following week to ensure questionnaires were returned. It was made clear that coaches and gymnasts could return their questionnaires separately (either post or email) to avoid responses being seen by the other party whilst returning. In total 15 gymnasts and two coaches returned their completed questionnaires in this way. Once the competition was completed the judges' scores were obtained once a full and correct set of results had been issued. Full ethical approval was given for this study by the University of Birmingham Ethical Committee.

The first analysis conducted was an assessment of the internal consistency of the gymnastic version of the CES and modified CES; this was conducted using the Cronbach Alpha statistic. Correlational analyses also aid in the validation of the measure by identifying that variables that should be related are shown to be correlated statistically. Multiple regression analysis enabled the relationship between coaching effectiveness (total coaching effectiveness and also each coaching effectiveness dimension) and performance scores to be established by allowing multiple predictor variables to be simultaneously investigated in relation to a dependent variable. The two gender-related hypotheses were examined by MANOVA so male versus female coaching efficacy scores and the responses of athletes coached by a coach of the opposite sex versus a coach of the same sex could be compared. Comparison of coaches' rating of efficacy and gymnasts' ratings of effectiveness were calculated using the 95% Confidence Interval approach, (Short and Short 2004; Kavussanu et al. 2008). This analysis identifies if the team rating of effectiveness is higher than, equal to or lower than their coach's efficacy rating. Therefore direct comparisons are easily observable.

Scale Reliabilities

The Cronbach's alpha results for the modified version of the CES for the sport of gymnastics are shown in Table 2.

Variable	α coach	α gymnasts
Total CE/CEFF	.89	.95
Motivation CE/CEFF	.68	.91
Game Strategy CE/CEFF	.57	.88
Technique CE/CEFF	.91	.84
Character Building CE/CEFF	.38	.81

Table 2. *NB*. CE/CEFF= coaching efficacy/coaching effectiveness

Cronbach's alpha coefficients for motivation, game strategy and character building subscales were all less than .70 for the coaches. Therefore the contributions of individual items to a subscales alpha were looked at to see if alpha coefficients could be improved through their removal. The motivation item "During competition prepare your athletes' for their performance", once removed brought the Cronbach's alpha coefficients for this subscale up to .71. The original item this one was adapted from has been discussed as problematic in previous research (Feltz et al., 1999; Myers et al., 2006; Boardley et al., 2008), loading highly onto both motivation and game strategy subscales. The game strategy item "Use other athletes' performances during competition to develop your own athletes", when removed increased the Cronbach's alpha for the game strategy subscale to .77. It could be argued gymnastic coaches do not engage in this behaviour so this item was removed from all further analyses. All character building items proved to be problematic as removing each of the four items did not increase the Cronbach's alpha above .70. Therefore the character building subscale was not used for further investigations. The total coaching efficacy Cronbach's alpha coefficient for coaches was recalculated without the problematic motivation and game

strategy items and all four of the character building items. The adjusted Cronbach's alphas

with the removed items are presented in Table 3.

Variable	α coach
Total CE	.90
Motivation CE	.71
Game Strategy CE	.77

Table 3. *NB*. CE= coaching efficacy

Descriptive Statistics and Correlations

The descriptive statistics and zero order correlations between the subscales for coaches and

athletes are shown in Tables 4 and 5. Coaches reported high levels of efficacy with technique

the highest rating and motivation the lowest. Pearson's correlation analyses for the coach data

identified that all three coaching efficacy dimensions measured were significantly and

positively related to total coaching efficacy and each other with the exception of motivation

and technique efficacy. Also coaching experience and age of the coach were highly positively

correlated at a significant level.

Variable	M	Range	SD	1	2	3	4	5	6
1.Motivation CE	8.24	7.00-9.29	.72						
2.Game strategy CE	8.33	6.67-9.67	.76	.70*					
3.Technique CE	8.52	6.00-10.00	1.18	.38	.64*				
4.Total CE	8.40	7.00-9.52	.70	.77*	.89*	.85*			
5. Age	25.06	20-51	7.77	.35	.38	.43	.46		
6.Years coaching	8.90	0.5-35	7.77	.35	.44	.43	.49	.97*	

Table.4 Descriptive statistics and zero order correlations for coaches, *p<0.01.

Variable	M	Range	SD	1	2	3	4	5	6	7	8
1.Motivation CE	7.77	3.43-10.00	1.22								
2.Game strategy CE	7.65	3.00-10.00	1.25	.75*							
3.Technique CE	8.15	6.00-10.00	1.00	.70*	.78*						
4.CharacterBuilding CE	7.84	3.75-10.00	1.34	.74*	.58*	.51*					
5.Total CE	7.85	5.35-10.00	1.04	.93*	.90*	.85*	.80*				
6.Age	19.79	16-30	1.91	.06	.06	.04	.03	.06			
7.Years Gymnastics	10.26	0.3-18	5.11	-.10	.01	-.01	-0.4	-.04	.11		
8.Performance score	28.88	2.20-54.98	9.77	-.18	-.03	-.08	-.12	-.12	.07	.39*	

Table 5. Descriptive statistics and zero order correlations for gymnasts, *p<0.01.

Athletes rated their coaches highest in technique effectiveness and lowest in game strategy effectiveness. Pearson's correlation analyses for the gymnasts' data demonstrated positive moderate to high significant interrelations between the four coaching effectiveness dimensions and also to total coaching effectiveness. Age was not shown to be significantly correlated to any coaching effectiveness dimension or total coaching effectiveness. Gymnastic experience and performance scores were positively moderately significantly correlated.

Athlete Perceptions of Coaching Effectiveness and Performance

Multiple regression analyses were conducted to examine whether athletes' perceptions of their coach's effectiveness would positively predict their performance scores at competition. Each coaching effectiveness dimension was looked at separately (Table 6) to identify any potential differences. Age, years in gymnastics and time before competition that the questionnaire was completed was entered at step 1 to control for possible effects on performance. Results revealed that neither total coaching effectiveness nor any coaching effectiveness dimension had a significant effect upon performance. There was a trend towards a negative relationship, indicating that the higher a gymnast rates their coach for effectiveness, the lower their performance score however as already stated this was not a significant relationship.

Gender Differences in Coaching Efficacy

Gender differences in coaching efficacy scores were examined by conducting MANOVA. This analysis revealed there were no significant gender differences for coaching efficacy, $F_{(4,11)} = 194$, $p=.173$, partial $\eta^2 = .41$, multivariate main effects. MANOVA analysis for gender differences for coaching effectiveness revealed a multivariate main effect of $F_{(5,103)} = 1.65$, $p=.152$, partial $\eta^2 = .07$. Follow-up ANOVAs revealed no significant differences for motivation, games strategy and technique effectiveness. However females ($M=8.02$, $SD=1.18$)

were shown to report significantly higher scores than males (M=7.36, SD=1.61) for character building effectiveness, $F(1,107)$ =5.51, p=.021, partial η^2= .05. Total effectiveness scores also approached significance, $F(1,107)$ =3.52, p=.063, partial η^2= .03 (males M=7.56, SD=1.21, females M=7.96, SD=0.96).

Predictor variables		B	SEB	95%cl for B	β	t	$Sig.$
Total Coaching Effectiveness							
Step 1	Age	.22	.47	-.71, 1.14	.04	.46	.64
	Years' experience	.72	.17	.38, 1.06	.37	4.17	.00
	Time before Comp	.33	.67	-1.00, 1.66	.05	.50	.62
Step 2	Total CE	-1.05	-85	-2.74, .64	-.11	-1.24	.22
Motivation Coaching Effectiveness							
Step 1	Age	.20	.46	-.69, 1.15	.04	.49	.63
	Years experience	.70	.17	.36, 1.04	.37	4.05	.00
	Time before Comp	.26	.66	-1.05, 1.57	.04	.40	.99
Step 2	MCE	-1.17	.72	-2.60, .27	-.15	-1.61	.11
Technique Coaching Effectiveness							
Step 1	Age	.20	.47	-.73, 1.12	.04	.42	.68
	Years experience	.73	.17	.39, 1.07	.38	4.22	.00
	Time before Comp	.31	.67	-1.03, 1.65	.04	.46	.65
Step 2	TCE	-.86	.09	-2.64, .91	-.09	-.96	.34
Game Strategy Coaching Effectiveness							
Step 1	Age	.19	.47	-.74, 1.12	.04	.41	.68
	Years experience	.73	.17	.39, 1.08	.38	4.22	.00
	Time before Comp	.31	.70	-1.07, 1.69	.04	.45	.66
Step 2	GSCE	-.40	.74	-1.86, 1.07	-.05	-.54	.59
Character Building Coaching Effectiveness							
Step 1	Age	.19	.47	-.73, 1.11	.04	.41	.68
	Years experience	.72	.17	.38, 1.07	.38	4.18	.00
	Time before Comp	.22	.66	-1.09, 1.54	.03	.34	.74
Step 2	CBCE	-.75	.66	-2.05, .55	-.10	-1.14	.26

Table 6. Regression analysis outcome for coaching effectiveness dimensions and total coaching effectiveness on performance score (judge rating).

Mismatch in Gender between Coach and Gymnasts

MANOVA was also performed to assess if a mismatch between the gender of coach and gymnast had an effect upon coaching effectiveness perceptions. These analyses revealed no significant difference in coaching effectiveness ratings between those coached by a coach of the same sex opposed to those coached by a coach of the opposite gender, $F(5,103)$ =1.40, p=.232, partial η^2= .06.

Comparing Coach and Gymnasts Ratings

To examine whether coaches' rating of their coaching efficacy were similar to their gymnasts' perceptions of their coaching effectiveness, 95% Confidence Interval calculations were performed. A group mean was calculated for gymnasts who had the same coach. This mean group rating was compared to the coach rating. The 95% Confidence Interval was calculated by adding to the group mean (for the upper limit) and subtracting from the group mean (for the lower limit) the *SE* multiplied by the t-statistic associated with a p of .05. The equation was, group mean ± (*SE* * t-statistic). A coach's score was considered lower than their athletes if it was below the lower limit of the 95% Confidence Interval, higher if it was above the upper limit and equal if between the limits. The number of coaches classified in each category for each coaching efficacy dimension and total coaching efficacy are presented in Table 7. Due to the issues surrounding the reliability of the measure with coaches' responses, the character building dimension could not be included.

Coaching Efficacy dimension	Coach Classification		
	Lower	**Equal**	**Higher**
Total coaching efficacy	**2** (12.5%)	**8** (50%)	**6** (37.5%)
Motivation efficacy	**3** (18.75%)	**7** (43.75%)	**6** (37.5%)
Technique efficacy	**3** (18.75%)	**7** (43.75%)	**6** (37.5%)
Game strategy efficacy	**2** (12.5%)	**8** (50%)	**6** (37.5%)

Table 7. Number of coaches rating themselves as Lower, Equal or Higher than their athletes' ratings.

Results showed for all four dimensions more coaches rated themselves equally to their gymnasts than lower or higher. However, for motivation and technique efficacy this was by only one coach more than the higher category. 37.5% of coaches rated themselves higher on all four dimensions listed. There is only a maximum of two coaches difference between the equal and higher categories. Few coaches rated themselves lower than their gymnasts' ratings.

CHAPTER IV - DISCUSSION

The aims of this study were to determine whether: gymnasts' perceptions of their coach's effectiveness would positively predict gymnasts' competitive performances; gender differences existed for the game strategy coaching efficacy dimension in gymnastics; athletes coached by a coach of the same sex rated their coach to be more effective than those coached by a coach of the opposite sex; and coaches ratings of their coaching efficacy were higher than their athletes' ratings of coach effectiveness. These aims have all been informed by existing coaching efficacy/effectiveness research, which has been discussed in the literature review of this paper. Apart from the first aim they have all been previously investigated. The new undertaking of this current investigation is to explore these relationships within the sport of gymnastics. The relationships between coaching efficacy/effectiveness and various individual and outcome variables (for both coach and athlete) identified in previous research may not apply to gymnastics. This raises the issue of how the specific sporting environment can impact upon coaches' and athletes' behaviours and personal thoughts and attitudes. The ideas proposed in Social Cognitive Theory (Bandura 1986) and investigated in this study show there are many considerations which impact upon coaching efficacy and effectiveness. It is important to acknowledge these factors for a full understanding of good coaching practice.

Athlete Perceptions of Coaching Effectiveness and Performance

Regression analyses indicated that athletes' perceptions of coaching effectiveness did not significantly predict competitive performance for any coaching effectiveness dimension. These findings are not in support of the relevant hypothesis. Although there is a lack of existing research investigating the link between coaching efficacy/effectiveness and

performance much research exists which would support the proposed hypothesis. Various studies have reported that coaches with high efficacy engage in coaching behaviours that athletes find beneficial to their sporting performances (Weiss and Fredreichs, 1986; Vargas-Tonsing et al., 2004). Feltz et al. (1999) also identified in their initial study that high coaching efficacy was related to a higher winning percentage for basketball coaches. The reason the findings from the current study could differ from the original findings of Feltz et al. (1999) may be due to methodological differences between the investigations. Feltz et al. (1999) investigated coaching efficacy whilst coaching effectiveness is the measure compared to performance in the current investigation. The link between coaching efficacy and performance is the athlete's perception of coaching effectiveness. Coaching efficacy and effectiveness may have different relationships with performance, which may explain the current findings. Also Feltz et al. (1999) used team sport participants as opposed to the gymnasts in the current investigation. It has previously been identified (Baker, Yardley and Côté, 2003) that satisfaction with a coach for team athletes was positively predicted by coaches' demonstrations of seven behaviours (mental preparation, technical skills, goal setting, physical training, competition strategies, personal rapport and negative personal rapport). This relationship was moderated for athletes from individual sports (which included gymnasts). Their satisfaction with their coach was influenced to a much lesser extent by their coach demonstrating the seven behaviours investigated. This study by Baker et al. (2003) is obviously not linked to performance but does raise the question that sport type may play a part in influencing the perceptions an athlete has of their coach. This is a question which would need further investigation to clarify. The performance measures were also different between Feltz et al. (1999) and the current investigation. The current study used a one off competition performance score. Feltz et al. (1999) used a win/loss record over a period of

time. The one off performance score captures the perception of coaching effectiveness in relation to one specific time point and one performance. It may not take into account progression and skill development. Different personal or environmental factors may affect that specific performance causing different results than may be obtained at another time point. However as in the study by Feltz et al. (1999) the coaches who have a better win/loss record are more likely to report higher coaching efficacy. This is because their success will feed back to influence their efficacy beliefs, causing a reciprocal relationship between the two. The two performance measures used in the current study and by Feltz et al. (1999) are assessing different performance timescales so direct comparison is difficult. These differences in methodology between the current study and Feltz et al. (1999) may help explain the difference in findings. The lack of significant findings could also be explained by the small sample size used in the current investigation. A greater sample would increase the chance of relationships emerging and the chance of statistically significant findings.

Gender Differences in Coaching Efficacy

There were no differences between male and female coaches' ratings of their game strategy efficacy. This finding is in contrast to the findings of Kavussanu et al. (2008) and the relevant hypothesis. Kavussanu et al. (2008) had a much larger sample than the current study and therefore greater statistical power (Thornton and Lee, 2000) which may explain the difference in findings. Kavussanu et al. (2008) sampled 26 coaches and 291 athletes within their study as opposed to the 16 coaches and 109 gymnasts sampled in the current investigation. A large scale investigation into the potential differences between the genders for game strategy efficacy across a range of sports would be a useful avenue for future research.

Mismatch in Gender between Coach and Gymnasts

There was also found to be no difference in ratings of perceived coaching effectiveness for gymnasts coached by someone of the same gender compared to those coached by a coach of the opposite gender. This was for all coaching effectiveness dimensions including total coaching effectiveness. This is again in contrast to Kavussanu et al. (2008) and the relevant hypotheses. The fact that the present research was conducted within the sport of gymnastics could potentially explain this unexpected finding. In support of the current findings, Côté and Salmela (1996) have identified that expert gymnastic coaches plan training similarly regardless of whether they are coaching males or females. Côté and Salmela (1996) found that gender and more particularly gender mismatch did not influence how training sessions were designed and structured by the gymnastic coaches. It seems sport type may influence the extent to which gender mismatch has an effect upon coaching effectiveness ratings. As shown by the findings of this study and supported by the existing literature the sport specific demands a gymnast expects from their coach are more relevant in influencing how they perceive their coach than whether their coach is the same gender as themselves.

Comparing Coach and Gymnasts Ratings

Consistent with existing literature and the proposed hypothesis there was an overall tendency for coaches' ratings of their efficacy to be higher than the mean ratings of effectiveness provided by their gymnasts. Short and Short (2004) and Kavussanu et al. (2008) also compared athletes' and coaches' ratings, with both finding coaches rated themselves higher than their athletes. In addition to the two studies mentioned above it has also been demonstrated in basketball that coaches tend to rate themselves more favourably than their athletes for various other coaching behaviours including: corrective instructions, positive

reinforcement, ignoring mistakes, keeping control, organisation, general technical instructions and general encouragement (Lemonidis, Tzioumakis, Karypidid, Michalopoulou, Gourgoulis and Zorbanos, 2013). This lends further support to the current findings as athletes' perceptions of their coach's effectiveness are likely to be based upon the behaviours in which the coach engages (Boardley et al., 2008). Therefore coach training courses should aim to raise coaches' awareness of how athletes may perceive their effectiveness differently to how the coaches judge themselves.

__Limitations__

The main limitation of this investigation is the sample size. This has already been discussed in relation to coaching effectiveness and performance, and gender differences for game strategy efficacy. Trends did emerge, such as the overall negative trend between all dimensions of coaching effectiveness and performance, with motivation effectiveness the closet to significance. With a larger sample this trend may have proved significant. A larger scale study would mean more gymnasts and coaches could be recruited and a more powerful investigation conducted. Even with a small sample this current investigation has raised questions which if examined with a larger sample may provide new insights into coaching efficacy and effectiveness.

As with all research, this study had a number of further limitations than those mentioned in relation to the specific hypothesises that should be acknowledged. Firstly although the gymnastic version of the coaching efficacy scale adapted for gymnasts showed acceptable levels of internal consistency, the one adapted for coaches did not. The measure developed for use with the coaches in this study showed low levels of internal consistency for the motivation, game strategy and character building subscales. The motivation and game strategy

subscales both included items which had been altered to make them applicable to gymnastics. The character building subscale had not been altered from the original coaching efficacy scale. More specifically, the entire character building dimension had to be removed from analyses due to low internal consistency. This suggests that character building may be perceived differently in gymnastics. Therefore this subscale may need some development to make it more relevant in this sport so it can be retained within the scale and used in future research. To achieve adequate internal consistency items needed to be removed from the other two subscales. One item from the motivation subscale (i.e., "During competition prepare your athletes for their performance") and another from the game strategy subscale (i.e., "Use other athletes' performances during competition to develop your own athletes") were removed. These problems with internal reliability could be due to issues relating to adapting an existing measure for use with a specific population for which it was initially was not intended. The original CES was primarily developed to be used as a generic measure of coaching efficacy and is not sport specific. The dimensions of coaching efficacy may have a different significant or relevance in different sports. Development of sport specific versions of the coaching efficacy scale would address this problem. The current study has made an initial attempt at this and has highlighted the need for greater specificity of the measure if used with one sporting population.

The removed motivation efficacy item "During competition prepare your athletes for their performance", has previously been identified as cross loading onto both the motivation and game strategy subscales (Feltz et al., 1999; Myers et al., 2006), and has been removed from the scale in past research (Boardley et al., 2008) to increase the reliability of the CES. In contrast to this the game strategy item which was removed was developed for this study. The seven game strategy items were all altered in an attempt to make them more applicable to

gymnastics. The responses from the pilot study suggested no problems with relevance for any of the revised game strategy items. However, no validity testing was carried out at this stage to ensure the items did indeed measure game strategy. This may have identified problems before the full scale study. Further work is clearly needed to ensure the game strategy and character building constructs are assessed appropriately for the sport of gymnastics. This would take into account the specific environmental demands of the sport. This is important as the environment directly influences the behaviour and beliefs in which coaches and athletes engage. The specific sporting environment needs to be more widely investigated. There is already existing research identifying coaching efficacy differences between types of coaching group (Feltz et al., 2009) but this should be extended to explore the different nature of the four coaching efficacy dimensions in relation to different sports. Future research needs to trial and develop a more reliable version of the gymnastic CES to ensure it is a valid measure to use with this population. It should also seek to examine the relevance of The Coaching Efficacy Model (Feltz et al., 1999) in a variety of specific sporting environments.

In line with this idea that coaching efficacy and effectiveness should be investigated in different specific sporting situations the current investigation specifically focused on assessing coaching efficacy/effectiveness within the sport of gymnastics. Because of this the results are not generalisable to all individual sports. For example, the game strategy dimension has proved problematic to apply to gymnastics. However it would be easily transferable to tennis. Even though these are both individual sports the dimensions of coaching efficacy apply to them differently. The findings of the current study in gymnastics could not be expected to be found in tennis. The specificity of the gymnastic environment creates challenges for the coach and athlete. This prompts specific behaviours and expectations to meet the demands of the sport. As discussed previously the transferability of

The Coaching Efficacy Model (Feltz et al., 1999) to specific sports is not straightforward as proved by this current investigation. Consideration is needed when revisions are undertaken to make the model completely relevant to specific sports. This may limit the generalisabilty of any findings.

Another study limitation relates to the timing of the data collection which could have influenced the ratings of coaching efficacy/effectiveness. Due to teams having different training days it was not possible for all the questionnaires to be completed the same time before competition. As all questionnaires were completed the week before a competition the range could be between one to seven days before the actual competition day. The actual range was between one and five, with the mean being 2.13 and *SD* 1.33. It has been previously shown that as time to competition reduces, competitive anxiety and self-confidence can increase and decrease respectively (Thomas, Maynard and Hanton, 2004). This is supported by evidence from Kenow and Williams (1992) who identified that athletes with higher anxiety and lower self-confidence evaluated their coach's behaviour more negatively than other athletes. It has also been demonstrated that an increase in gymnasts' anxiety levels is related to a decrease in rapport with their coach (Baker, Côté and Hawes, 2000). This could cause a short-term impact upon athletes' perceptions of their coach. If due to anxiety a gymnast questions their rapport with their coach approaching a competition, they may also perceive their coach's effectiveness more negatively. In the context of the current study this would mean lower perceptions of coaching effectiveness nearer competition. This could potentially help to explain the lack of significant findings linking coaching effectiveness and performance score in this investigation. Although time before competition of questionnaire completion could influence results in the ways discussed, controlling for it in the regression analysis did not indicate any significant effect for time before competition in the current

study. With sufficient numbers future research could compare those who completed the questionnaire at the start of the week to those who completed it just before the competition. Future research could also include psychological measures to investigate and control for any potential influence. It could then be established if psychological variables such as anxiety influence coaching effectiveness perceptions.

Future Research

As well as making an initial contribution in this research area, this study suggests a number of possible future research directions. First, more insight needs to be gained into the relationship between coaching efficacy and performance outcomes. This study has made progress with this largely uninvestigated relationship but a larger scale study would provide more reliable findings and provide evidence for the reliability of the current scale. It would be interesting to investigate the potential links between technical skill acquisition and levels of coaching effectiveness, as this could provide an alternative assessment of performance to the judges' scores used in this investigation. Inclusion of psychological measures may help to widen the understanding of what may impact upon gymnasts' perceptions of their coach's effectiveness and performance at competition. As already discussed research should explore how the Model of Coaching Efficacy (Feltz et al. 1999) can be explored in different sporting environments. This will establish whether the sources for and outcomes of different levels of coaching efficacy are generalisable. The relevance of the four coaching efficacy dimensions also needs to be explored within different sports. Each dimension may have different connotations within specific sporting environments. Findings from the current investigation support this. Gymnasts were shown to rate their coaches highest in technique effectiveness and lowest for game strategy effectiveness. Technique effectiveness is obviously directly transferable and strongly relevant to gymnastics. The game strategy subscale has been less easy to adapt. The

lower ratings for game strategy effectiveness could indicate that gymnasts didn't feel their coaches were exhibiting these behaviours as they were not relevant to gymnastics. Further investigations will help to clarify the link between the sporting environment, the personal cognitions of the athlete or coach, the behaviours in which they choose to engage and performance success. The relationships between these variables create optimal conditions for coaches and athletes to observe and take part in more sporting experiences and therefore learn and develop their skills. This will aid the athlete to become more successful while performing. This is not only through greater competency in their own sporting skills due to more mastery experiences but also due to more effective feedback and coaching behaviours exhibited by their coach.

Conclusion

This study has made two main contributions to the coaching efficacy/effectiveness literature. First, it is the first study to solely investigate an individual sport by applying the coaching efficacy model (Feltz et al., 1999). Second, it has also made an initial examination of the relationships between coaching efficacy, effectiveness and performance based within the sport of gymnastics. The area of coaching efficacy/effectiveness research has widely overlooked individual sports and this investigation has shown, at least for gymnastics, that results from studies on team sport cannot necessarily be generalised to individual sports. However, in addition the findings of this study have also demonstrated consistency between findings for team and individual sports concerning difference in ratings efficacy/effectiveness for coaches and athletes. In sum, although inherent limitations of the study should be addressed in future work, the current study has made a contribution to the literature through an initial foray into investigation of coaching efficacy/effectiveness in gymnastics.

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APPENDIX A

Coach Questionnaire Includes

1. Information sheet
2. Consent form
3. Demographic questionnaire
4. Coach version of gymnastic CES
5. Sheet to rate gymnasts

Coach Information sheet

Study Title: Coaching Practice in Gymnastics.

Primary Researcher: Kate Brailsford, BSc
Research Supervisors: Dr Ian D. Boardley
Dr Matt Bridge

Please read this information sheet carefully it will help you to decide whether you would like to participate in this MPhil research project.

What is the study about?
The purpose of this study is to investigate links between coaching and gymnastic performance.

What would participation involve?
You will be required to complete a short pre-competition questionnaire, rate your gymnasts' performance levels and provide scores from your athletes' most-recent competition/s. Your gymnasts will also be asked fill in a similar questionnaire from their perspective. The results from the coach and athlete questionnaires and the performance data will be compared to look for associations between them. Completion of the coaches' questionnaire will indicate your informed consent to participate in the study. However, coaches and athletes are free to withdraw from the study at any point without giving a reason.

What will happen to the data provided?
Individual data will be identified through the use of codes allocated at the time an athlete of coach agrees to participate. Personal details will not be linked to your data. Through this process all responses to questionnaires will remain confidential.

What will the data be used for?
The data will be used to test theoretical relationships and may be used in conference presentations and academic publications. Results should highlight practical ways coaches can improve their coaching as well as the performance of their gymnasts. Athletes and gymnasts can request an overall summary of the research findings in return for taking part in the study. Again, no individual data will be identifiable within this report.

Thank you for taking time to read this information sheet. Any further questions can be directed to the researchers at the email addresses listed above.

Consent Form

Project Title: Coaching Practice in Gymnastics.

Primary Researcher: Kate Brailsford, BSc
Research Supervisors: Dr Ian Boardley & Dr Matt Bridge

- I have read the information sheet and discussed the study with_____.

- Any questions I had have been answered to my satisfaction.

- I understand that my participation is voluntary and I am free to withdraw at any time, without giving a reason and without current or future medical care or ethical rights being affected.

- I agree to take part in the above study.

Name: _____ (Please Print)

Signature: _____

Date: _____

Witness: _____ (Please Print)

Signature: _____

Date: _____

Gymnastic Coach Questionnaire

Date Completed ……………….

D.O.B.:_____   Your Age: _____   Gender: F / M

Team/club you are the coach
of:_____

Level that you currently coach at (*please tick*):

    Recreational ☐   Club ☐   University ☐

       County ☐   Regional ☐   International ☐

Did you take part in gymnastics before becoming a coach?   Yes/No

If yes, for how many years did you participate in gymnastics? _____ years

What was the highest standard that you played at (please tick)?

    Recreational ☐   Club ☐   University ☐

       County ☐   Regional ☐   International ☐

Number of hours spent coaching this team per week (team identified

above):_____

Number of hours spent coaching independently of this team per week:_____

How many years have you been coaching this team? _____ years

How many years have you been coaching gymnastics? _____ years

Is coaching your full time profession?   Yes/No

PART A

For **each** of the questions listed below, please **circle** the number that best corresponds to your level of confidence.

How **confident** are **you** in **your ability** to…

1. Maintain confidence in your athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

2. Use other athlete's performances during competition to develop your own athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

3. During competition prepare athletes for their performance?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

4. Understand the demands of competitive situations?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

5. Instil an attitude of good moral character?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

6. Build the self-esteem of your athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

7. Perform or arrange demonstrations of the skills of your sport?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

8. Adapt to different competitive situations?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

9. Motivate your athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

10. Provide performance feedback to your athletes during competition?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

11. Build team cohesion?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

For each of the questions listed below, please circle the number that best corresponds to your level of confidence.

How **confident** are **you** in **your ability** to...

12. Instil an attitude of fair play among your athletes?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

13. Coach individuals on technique?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

14. Build the self-confidence of your athletes?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

15. Develop athletes' abilities?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

16. Maximise your athletes' strengths during competition?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

17. Recognise talent in athletes?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

18. Promote good sportsmanship?

0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

19. Detect skill errors?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

20. Develop competitive routines to suit your athletes' abilities?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

21. Teach the skills of your sport?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

22. Build team confidence?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

23. Instil an attitude of respect for others?										
0	1	2	3	4	5	6	7	8	9	10
not at all confident				moderately confident						extremely confident

Can you please rate all the gymnasts you coach that will be competing at the upcoming competition out of 10 for their overall gymnastic ability. Rate them from 1-10, with 1 being the lowest ability and 10 a perfect gymnast. Please consider technical ability, mental attitude, aesthetic skills and any other relevant attributes to arrive at you rating of one overall gymnastic ability score for each gymnast.

Name	Rating (1-10)
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____
14. _____	_____
15. _____	_____
16. _____	_____
17. _____	_____
18. _____	_____
19. _____	_____
20. _____	_____
21. _____	_____
22. _____	_____
23. _____	_____
24. _____	_____
25. _____	_____

Please note the numbers alongside the names are not a rating scale for the gymnasts they are for use in analysis. Please just list your gymnasts in any order.

Thank you for you and your teams cooperation.

APPENDIX B

Gymnast Questionnaire Includes

1. Information sheet
2. Consent form
3. Demographic questionnaire
4. Athlete version of gymnastic CES

<u>**Gymnast/Parent Information sheet**</u>

Study Title: Coaching Practice in Gymnastics.

Primary Researcher: Kate Brailsford, BSc
Research Supervisors: Dr Ian D. Boardley
                             Dr Matt Bridge

Please read this information sheet carefully. It will help you to decide whether you would like to participate in this MPhil research project.

What is the study about?
The purpose of this study is to investigate links between coaching and gymnastic performance.

What would participation involve?
You will be required to complete a short pre-competition questionnaire and give a rating of your own performance. Your score from your previous competitive performance will also be obtained. Completion of the questionnaire will be taken as your informed consent to participate in the study. However, participants are free to withdraw their participation at any point without giving a reason.

What will happen to the data provided?
Individual data will be identified through the use of codes allocated once an athlete agrees to participate. Personal details will not be linked to your data so your coach will not be able to link and data they see to individual athletes. Through this process all responses to questionnaires will remain confidential.

What will the data be used for?
The data will be used to test theoretical relationships and may be used in conference presentations and academic publications. The study findings should highlight practical ways coaches can improve their coaching as well as the performances of the gymnasts they coach. You or your coach may request an overall summary of the research findings in return for taking part in the study. Again, no individual data will be identifiable within this report.

Thank you for taking time to read this information sheet. Any further questions can be directed to the researchers at the email addresses listed above.

<u>Consent Form</u>

Participant No.:_____

Project Title: Coaching Practice in Gymnastics.

Primary Researcher: Kate Brailsford, BSc
Research Supervisors: Dr Ian Boardley & Dr Matt Bridge

- I have read the information sheet and discussed the study with_____.

- Any questions I had have been answered to my satisfaction.

- I understand that my participation is voluntary and I am free to withdraw at any time, without giving a reason and without current or future medical care or ethical rights being affected.

- I agree to take part in the above study.

Name: _____ (Please Print)

Signature: _____

Date: _____

Witness: _____ (Please Print)

Signature: _____

Date: _____

Athlete Questionnaire

PERSONAL DETAILS

Date Completed ……………….

D.O.B.:_____   Age: _____   Gender: F / M

Team/club that you are part of:_____

Level that you currently participate at (*please tick*):

Recreational ☐   Club ☐   County ☐

Regional ☐   International ☐

How long have you been taking part in gymnastics? _____ years

Have you taken part in gymnastics at university? Y / N

How long have you been part of your current team (team identified above)?

_____ years

Who is your main/most influential coach? _____

How long have you been coached by your current coach? _____ years

What was the highest standard that you competed at (please tick)?

Recreational ☐   Club ☐   County ☐

Regional ☐   International ☐

On a scale of one to ten rate your overall gymnastic performance,

1   2   3   4   5   6   7   8   9   10

Rate in order of preference the pieces of equipment you will be competing on at the upcoming competition.

1. _____
2. _____
3. _____
4. _____
5. _____

PART A

Coaches differ in their ability to positively affect and improve the learning and performance of their athletes. For each of the questions listed below, please rate your coach's effectiveness by circling the appropriate number.

In **your opinion** how **effective** is your coach in **his/her ability** to ...

1. Maintain confidence in his/her athletes?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

2. Use other athlete's performances during competition to develop their own athletes?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

3. During competition prepare his/her athletes for their performance?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

4. Understand the demands of competitive situations?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

5. Instil an attitude of good moral character?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

6. Build the self-esteem of his/her athlete's?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

7. Perform or arrange demonstrations of the skills of his/her sport?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

8. Adapt to different competitive situations?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

9. Motivate his/her athletes?
0   1   2   3   4   5   6   7   8   9   10
not at all effective   moderately effective   extremely effective

10. Provide performance feedback to his/her athletes during competition?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

11. Build team cohesion?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

For each of the questions listed below, please rate your coach's effectiveness by circling the appropriate number.

In **your opinion** how **effective** is your coach in **his/her ability** to ...

12. Instil an attitude of fair play among his/her athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

13. Coach individuals on technique?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

14. Build the self-confidence of his/her athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

15. Develop athletes' abilities?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

16. Maximise his/her athlete's strengths during competition?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

17. Recognise talent in athletes?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

18. Promote good sportsmanship?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective					moderately effective					extremely effective

19. Detect skill errors?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective				moderately effective						extremely effective

20. Develop competitive routines to suit an athlete's abilities?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective				moderately effective						extremely effective

21. Teach the skills of his/her sport?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective				moderately effective						extremely effective

22. Build team confidence?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective				moderately effective						extremely effective

23. Instil an attitude of respect for others?										
0	1	2	3	4	5	6	7	8	9	10
not at all effective				moderately effective						extremely effective