

The Importance of Social support in Achievement contexts.

Volume 1

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Abstract

Previous research has implicated social support in a wide range of contexts, yet despite the extensive quantity of research, we are yet to fully understand the underlying mechanisms. Research into these mechanisms will not only have theoretical implications but also applied implications. This thesis examined the mechanisms underpinning social support in an achievement context. It is presented as series of three interrelated chapters, which comprise the four studies conducted. These are preceded by an introduction, and succeeded by a general discussion. The studies focused upon social support: the first examining the effects of a social support intervention within a performance context, the remaining three studies investigating perceived support and performance-related outcome variables within the coach-athlete relationship. The first study examined social support in a performance context assessing the influences of support upon the stress response. A neurocognitive approach found that when compared to participants in a non-support group, individuals who were given support showed less brain activations in the anterior cingulate cortex, a region associated with the initial stress response. However, results displayed that participants did not perceive support in the same way; not all participants who were given the support manipulation reported being supported. Studies two and three used multivariate generalisability theory to examine the relationship between perceived support and various outcome variables at the perceiver, target and relational levels of analysis. A univariate analysis revealed that the relational component was the most influential followed by the perceiver. Social support was positively associated with self-confidence, self-efficacy and positive emotions at the relational level of analysis. The fourth study used qualitative methods in order to delve further into how

athletes judge the supportiveness of their coaches and the antecedents of perceived support. The study found that the relationship between a coach and an athlete was the biggest contributing factor in perceived support judgements. This judgement relied heavily on the previous experiences that the athlete had shared with the coach. Overall, this thesis demonstrates that to understand the mechanisms underlying how social support effects various outcome variables, studies need to be conducted investigating how individuals develop their perceptions of support. This thesis has demonstrated that individuals perceived support in different ways. The final three studies showed that the supportiveness of one coach may be viewed differently by different athletes. Thus, coaches will not be viewed as supportive by every athlete that they work with. Consequently, interventions aimed at increasing levels of perceived support may not be successful unless the coach and athlete are optimally matched to create a highly supportive relationship. Theoretical and applied implications, in addition to future research are discussed throughout this thesis.

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Chapter 1: Introduction

A major area of research within both social psychology and sport psychology is social support. Broadly defined, social support refers to the “resources provided by others” (Cohen and Syme, 1985, p.xv). According to Uchino (2004), research into social support dates back to the 1970’s; searches have shown that social support research grew in popularity throughout the 1980’s to the present date.

Social support is one of the most researched psychosocial resources, appearing in a wide variety of journals (Lakey, 2010). Social support has been examined in a wide range of environments including nursing (Rodwell & Munro, 2013), education (Rice, Barth, Guadagno, Smith & McCallum, 2013), sport (Freeman & Rees, 2008), medicine (Feldman, Dunkel-Schetter, Sandman & Wadhwa, 2000), bereavement (Nikkola, Kaunomen & Aho, 2013) and military services (Smith et al., 2013). Within these areas social support has been associated with improved mental health (Uchino, 2013), physical health (Thoits, 2011; Uchino, 2009; Uchino, 2004) and physiological processes (Wills & Ainette, 2012; Thoits, 2011). In addition, social support has been linked with improved performance in a range of fields including, academic achievement (Klem & Connell, 2004) and sport (Rees & Freeman, 2009).

The prominence of research within this range of areas demonstrates the continuously rising interest in social support.

Structural and functional support

Social support has previously been conceptualised as the quantity of social relationships an individual has. Structural measures assess an individual’s social support network and index the total number of relations an individual has. These measures examine the primary social relationships, such

as marital partners and children. They may also investigate the frequency at which an individual communicates with friends, neighbours or relatives.

Social support may also be conceptualised as "*the level of supportive resources available to a person in time of need (irrespective of the number of connections).*" (Wills & Ainette, 2012, p.464). This suggests that social support refers to the quality of support as opposed to the quantity of support available. Functional measures of support focus on examining whether individuals perceived that they have support available to them if they were to experience a problem. These measures do not determine who the support may come from; only that it is available if needed.

According to Wills and Ainette (2012), structural and functional measures are not highly correlated; "the number of persons one knows is not strongly related to the availability of emotional and other types of support." (p.465). However, both have been linked with various outcomes, thus, it has been suggested that they have such affects through differing mechanisms (Uchino, 2006).

Definitions of social support

Within the wealth of research examining social support, multiple definitions have been proposed to encompass the multidimensional construct. According to Miller and Ray (1994), researchers attach interchangeable meanings to the term 'social support' based on the qualities of their own interpersonal relationships. Thus, a variety of definitions have been proposed (Heller & Swindle, 1983; Shumaker & Brownell, 1984; Cohen & McKay, 1984; Cohen & Syme, 1985). Vangelisti (2009) suggested that these definitions are often devised using one of the following three approaches: the sociological approach, which looks at the degree to which individuals are integrated as a

social group; the psychological approach, which emphasises the perceived availability of support; and finally, the communication approach, which focuses on the interactions that occur between the providers and recipients of support.

Lakey (2010) has taken a similar approach to defining social support, suggesting that social support consists of three sub-constructs: social integration, enacted support and perceived support. Social integration refers to “*The number of different types of relationships in which recipients participate (e.g., spouse, siblings, children friends)*” (p. 3). Enacted support refers to “*Specific helping actions (e.g., advice, reassurance, tangible assistance) provided by family and friends during stress*” (p. 3). Perceived support refers to “*A support recipients subjective judgement that friends and family would provide quality assistance during times of stress*” (p. 3). These sub-components have been researched extensively, but links between social integration and psychological outcomes remain inconsistent.

Studies examining social integration often examine the extent to which individuals are integrated within a social network. These studies measure and assess the relationships between various social roles and social bonds. Cohen (2004) explained that social integration operates via a main effects mechanism. He stated that “*Individuals who participate in a social network are subject to social controls and peer pressures that influence normative health behaviours*” (Cohen, 2004, p. 678). The social networks that individuals are integrated within may influence the type of behaviours and activities they partake in. “*Integration may also engender feelings of responsibility for others resulting in increased motivation to take care of oneself so that responsibility can be fulfilled.*” (Cohen. 2001, p. 678). In addition to this, Cohen (2001) stated that social integration can impact upon an individual’s sense of self. An individual may create expectations

and values based upon those that are common to the individuals within a specific social network. *“In meeting normative role expectations, individuals gain a sense of identity, predictability and stability; of purpose; and of meaning, belonging, security and self-worth.”* (Cohen, 2004, p. 678).

According to Uchino (2004), social integration measures are primarily focused on the assumption that perceived support is available to an individual; and that it is healthy to have multiple relationships (Thoits, 2001). Contrary to this, some researchers have demonstrated that having a large number of social ties can have debilitating effects on outcomes such as health (Burg & Seeman, 1994). Researchers have suggested that social integration can allow individuals to be exposed to unhealthy behaviours (Burg & Seeman, 1994). Research dating back to the 1950’s demonstrates the negative influences of social integration. Durkheim (1951) stated that social integration can cause individuals to be susceptible to the social control of others. Another way in which social integration has been suggested to influence an individual is through the stress that being in a relationship can create. For example, an individual may experience feelings of responsibility and duty towards another individual. In contrast with this research, Schwarzer, Bowler and Cone (2013) found that the more socially integrated a police officer was, the lower the level of stress they experienced. Although there remains some debate over the positive and negative effects of social integration, recent research suggests that it has a more favourable effect on a variety of outcome variables.

In addition to social integration, enacted support and perceived support have been investigated. According to Uchino, Bowen, Carlisle and Birmingham (2012), *“Perceived social support is one of the most well-documented psychosocial factors influencing physical health outcomes.”* (p. 949). According

to Lakey (2010) links between perceived support and psychological outcomes are consistent, irrespective of stress levels. Uchino, Holt-Lunstad and Betancourt (1999) investigated the effects of perceived support on resting heart rate. They found that perceived support was related to lower resting blood pressure in older adults.

Despite agreement between perceived and enacted support being beneficial for a close relationship (Antonucci & Israel, 1986), perceived and enacted support have an unusual and complicated relationship (Dunkel-Schetter & Bennett, 1990). Cutrona (1986) asked participants to complete daily diaries of supportive behaviours and to complete the Social Provisions Scale (Cutrona & Russell, 1984), a questionnaire often used to assess perceived levels of support. The results of the study showed that during a stressful situation, these enacted and perceived support measures were consistent, yet, on other less stressful days, they were dissimilar.

According to Kaul and Lakey (2003) enacted support has often been associated with a lack of outcomes or negative outcomes. This may be because receiving support from another person may reduce an individual's self-esteem, or attract more attention to the issue (Kaul & Lakey, 2003). Thoits (2011) also commented on the lack of outcomes associated with enacted support. She alluded that this may have been due to problems related to the measurement of enacted support. To elaborate, enacted support is often measured during a stressful period or with regards to a previously stressful situation (Hobfoll, 2009). Contrasting this, perceived support is typically measured by asking individuals to think about the support they have previously experienced and from a more generalised judgement of that support. This may also explain why there is little common variance between enacted and perceived support.

Previous research has shown that there is only 12% common variance between enacted support and perceived support (Haber, Cohen, Lucas & Baltes, 2007). Lakey et al. (2002) conducted a study examining perceived support and low emotional distress. They investigated the role of enacted support, dyad similarity, and provider personality. The study examined the perceived and enacted support and dyad similarity of one hundred daughter caregivers of parents with suspected Alzheimer's disease and their most important support providers. The study stated that "*the consensus between providers and caregivers about emotional-enacted support was related significantly to caregivers' judgements of providers' supportiveness.*" (Lakey et al., 2002, p 1153). These findings suggest that enacted and perceived support may be associated when the constructs are investigated in this manner.

Uchino (2004) provides further explanations for the unrelated nature of perceived and enacted support. He explains that measures of available support rely upon an individual's cognitive representations of social support; this may be inaccurate. It was also suggested that support may fluctuate over time, for example, bereaved individuals may experience a multitude of support after the initial bereavement, which may decrease as time goes on. Another reason for perceived support and enacted support to remain un-correlated may be that individuals in need of support may not always feel they are able to ask for it. This may cause an individual to have high levels of perceived support, yet not utilise it and thus not have high levels of enacted support.

Direct and indirect effects of social support

A common question posed by researchers is 'does social support influence outcome variables via direct or indirect processes?' There are aspects of both structural and functional social support which may influence outcomes

such as health directly, however, it is also deemed possible that social support may affect other processes that are in turn linked with outcome variables. The direct versus indirect effects has both theoretical and applied implications. In an applied or research environment, if social support influences variables via a direct approach, then a practitioner or researcher would aim an intervention at increasing an individual's social support. However, if mediating processes are involved, then the practitioner or researcher would need to determine the mediating process and reflect on how these relate to social support.

Social Support in Sport

Social support (here used as a term encompassing both perceived and enacted support) has been associated with beneficial effects on various outcomes including: burnout (DeFreese & Smith, 2012; Gould, Tuffey, Udry, & Loehr, 1996; Raedeke & Smith, 2004), leadership, (Chelladurai, 1993), group cohesion (Westre & Weiss, 1991), self-confidence (Freeman & Rees, 2009), career transitions (Reynolds, 1981; Wylleman, Alfermann & Lavalee, 2004), adherence to injury rehabilitation programmes (Bianco, 2001), and performance (Gould, Guinan, Greeleaf, Medburry, & Peterson, 1999; Rees & Hardy, 2004; Rees, Hardy, & Freeman, 2007). As previously stated, perceived and enacted support should be considered as separate dimensions (Haber et al., 2007); therefore, researchers have examined the effects of perceived support and enacted support independently of one another. Due to perceived support being more consistently linked with more favourable outcomes, more research has focused upon the perceptions of support. Researchers found that perceived support was positively associated with performance (Gould, Greenleaf, Chung, & Guinan, 2002; Freeman & Rees, 2009) and other outcome variables such as self-confidence (Rees & Freeman, 2007). Despite the enormity of research

dedicated to social support the mechanisms underlying how social support impacts an individuals' mental and physical health, well-being, performance and performance-related outcome variables remains unclear. In order to fully understand how social support can benefit individuals we must gain an understanding of these mechanisms.

In order to examine social support an arena is required in which regular acts of social support can be witnessed and assessed. This environment can be created within a laboratory setting in which supportive behaviours can be observed and measured. Alternatively, social support can be measured within a more naturalistic situation. Social support is particularly prevalent within the realm of sport and is particularly evident within the coach-athlete relationship. The supportive acts of coaches have been clearly described by Jowett and Poczwadowski (2007). The coach-athlete relationship supplies a rich source of data for analysing naturalistic social support interactions.

Rees, Freeman, Bell and Bunney (2012) conducted a study examining the perceived supportiveness of coaches using the nine items adapted from the questionnaire used by Freeman and Rees (2009). The paper included three studies: the first involved fifty male club level football players rating the supportiveness of five 'well-known' football managers from the English Premier League. The second study entailed sixty-nine University athletes from a range of both team and individual sports rating the supportiveness of five videoed coaches. The third study involved fifty-one youth 'gifted and talented' athletes rating the supportiveness of five of their coaches. The studies found that perceived support is mostly relational, in that, it is most significantly influenced by the relational component. This study demonstrated the underpinnings of how

athletes form their perceptions of coach supportiveness, providing a foundation for future research to build and expand upon.

Mechanisms

As recognised by Thoits (2011), research has been desired to identify the mechanisms through which social support is associated with favourable outcomes, such as improved psychological well-being. Thoits (2011) goes on to describe seven potential mechanisms: social influence/social comparison, social control, role-based purpose and meaning, self-esteem, sense of control, belonging and companionship and perceived support availability. Below is a brief description of these proposed mechanisms, see Thoits (2011) for a more extensive review.

Social influence/social comparison suggests that individuals assess and compare themselves to other members of their social network (Thoits, 2011). This may cause an individual to exert the norm behaviours of that group, such as improved health and exercise habits.

Social control denotes "*the explicit attempts of social network members to monitor, encourage, persuade, remind, or pressure a person to adopt or adhere to positive health practices. Social control efforts can discourage risky health behaviours but can also backfire if they are perceived as overly intrusive or dominating, creating resentment and resistance to behaviour change.*" (Thoits, 2011, p 148).

Behavioural guidance, purpose and meaning mechanisms imply that being a part of a social relationship causes an individual to feel committed and that they have a responsibility to the other person in the relationship (Thoits, 2011). This encourages them to take care of themselves and avoid risky behaviours. The role that they take within a relationship guides their behaviour

as different roles have norms and values attached. This provides behavioural guidance regarding the behaviours that are expected of the individual.

Self-esteem mechanisms infer that individuals appraise their role performance. If they conclude that they have performed their role, this will increase their self-esteem. Thoits (2011) stated that “*Self-esteem should mediate between the number and variety of individuals' social ties/role relationships and their mental health.*” (p. 148)

Sense of control or mastery mechanisms suggests that by successfully performing ones role, a sense of mastery and control is achieved. Mastery and achievement have previously been associated with increases in self-confidence and self-efficacy (Bandura, 2001)

Belonging and companionships mechanisms advocate that by being a part of a social relationship an individual had a sense of belonging. This stems from feelings of acceptance, attachment and mutual obligation. According to Uchino (2006) companionships creates positive affect.

Perceived social support mechanisms focus on the emotional, informational and instrumental support that individuals believe they have available to them. The disagreement remains between researchers as to whether support directly influences psychological well-being or via other independent variables.

The current research examined both enacted and perceived support with later studies focusing on how perceptions of support are formed.

Methods of Examining Social Support

There have been various approaches to measuring support; this is mainly due to the differing conceptualisations of social support. Some researchers feel that social support is a multidimensional construct (Cutrona &

Russell, 1990), whereas others feel that it is a unidimensional construct (Sarason, Sarason & Pierce, 1990). According to Lakey and Cohen (2000), social support methods should be chosen with much care and consideration regardless of a researchers' viewpoint.

Measures. Social support measures should be relevant to the target populations and the situational context in which they are to be used (Bianco & Eklund, 2001; Wills & Shinar, 2000). This thesis required support measures to be relevant to the specific experiences of athletes (Rees & Hardy, 2000).

Perceived social support measures share common features, such as focusing on the perceptions of available support as a property of the individual's entire social support network (Pierce, Sarason, & Sarason, 1991). By looking at the whole network, interactions between significant providers and an individual may be overlooked. These interactions may reveal more about why support perceptions are formed. Thus, it would be beneficial to examine perceived support within specific relationships if we want to gain a deeper understanding of the mechanisms underpinning how social support judgements are formed.

Mixed Methods Analysis

Mixed methods approaches to research have become enormously popular in recent years (Heyvaert, Maes & Onghena, 2013; Leech & Onwuegbuzie, 2009) due to the need to answer complex research questions. Mixed methods approaches involve combining both qualitative and quantitative research methods.

Mixed methods approaches have been organised into two groups: primary level, and synthesis level. The primary level mixed methods approach involve researchers collecting qualitative and quantitative data directly from study participants, for example, using questionnaires, interviews, and

observation methods of data collection. Synthesis level mixed methods approach includes data from multiple published qualitative and quantitative and primary mixed methods studies to create a systematic review. This thesis utilised a primary mixed methods approach, in which data was collected directly from participants across four studies.

fMRI Research

Novel and innovative approaches are needed to further investigate how social support influences various performance-related outcomes. Given that social support has been associated with both physiological and psychological outcomes, examination of social support could be extended to include more physiological components. One approach that combines social and biological fields of research is social neuroscience (Berntson & Cacioppo, 2000; Cacioppo & Berntson, 1992), often involving the use of brain imaging techniques.

Social neuroscience involves the examination of the reciprocal effects between social processes and neuroscientific principles and events. The term social neuroscience was first proposed by Cacioppo and Bernston in 1992 to encompass advances in brain sciences, animal models and neuroendocrine-immune interactions that were relevant to social phenomena. By using social neuroscience methods, we will be able to observe areas of activation in the brain that are associated with specific stimuli and environments, including experimentally manipulated social support.

Previous social support research has used fMRI approaches. For example, Eisenberger et al. (2007) examined the neural pathways linking social support to attenuated neuroendocrine responses. Eisenberger and her colleagues found that individuals who interacted regularly with supportive individuals demonstrated a reduced neuroendocrine response. The researchers

stated that more research is required in order to enhance our understanding of the neural underpinnings of the social support-health relationship. Evidence is required to show how social support can reduce the effects of stress and the mechanisms in which it does this. Eisenberger et al.'s (2007) study demonstrated that we can further our understanding and provide evidence of how social support influences performance-related outcome variables.

By examining social support at a neural level we may be able to further our understanding of the influences social support has upon performance-related outcome variables. The information gained from a social neuroscience approach may have implications for current theoretical and applied knowledge.

Generalisability Theory

Generalisability theory provides an additional approach to examining social support. When focusing on perceived support Univariate generalizability analysis (Cronbach, Rajaratnam, & Gleser, 1963) has the ability to analyse person perception and person by situation interactions. Despite not being a novel method, its application to sport psychology is fairly new, and even more so to social support within the coach-athlete relationship. Univariate generalisability theory breaks down person perception into three components.

When individuals rate the same provider's support, three influences have been identified (Lakey, 2010): perceiver influences, provider influences and perceiver-provider influences. Perceiver influences signify individual differences between people in rating targets' supportiveness. These differences include trait-like tendencies of perceivers to see all providers as more or less supportive, regardless of the characteristics of the provider. For example, Perceiver A may view all providers as more supportive than Perceiver B. Provider influences (also referred to as 'target' influences) reflect the extent to

which support judgments reflect the objectively supportive properties of providers. For example, Provider A may be perceived as more supportive than Provider B by all perceivers. Perceiver-provider influences (referred to as 'relational' influence) reflect systematic disagreement between perceivers that some targets are more supportive than other targets. For example, Perceiver A may perceive Provider A to be more supportive than Provider B, whereas Perceiver B may perceive Provider B to be more supportive than Provider A.

Studies conducted so far have used a variety of approaches, for example some have used a range of support providers. Neely et al. (2006) examined trait and social processes in the link between social support and affect in an experimental laboratory environment. They asked recipients and observers to rate recipient affect and provider support. Other studies such as Lakey and Scoboria (2005) asked some participants to rate members of their own social network, and others to identify their three most significant relationships. Another approach was to ask participants to rate the perceived supportiveness of characters from the popular television show 'Friends' (Lakey, Drew, Anan, Sirl & Butler, 2004).

Rees, Freeman, Bell and Bunney (2012) used generalisability analyses to examine how athletes perceived the supportiveness of coaches. Their paper contained three studies: study one involved fifty football players rating the perceived supportiveness of five premiership football managers. Study two involved sixty nine University athletes rating the perceived supportiveness of five videotaped coaches. Study three involved fifty one gifted and talented youth athletes rating the perceived supportiveness of five of their own coaches. Rees and colleagues (2012) found perceptions of support predominantly reflected relational influences.

To examine these relationships in more detail, multivariate generalisability analysis can be applied. This form of analysis enables researchers to examine relationships between two variables at the three different levels of analysis. For example, multivariate generalisability analyses can be used to examine how social support is associated with outcome variables such as self-efficacy at the perceiver, target and relational levels of analysis.

Lakey and Scorbria (2005) used multivariate generalizability analyses to investigate relations between personality traits of support recipients and social and trait influences. They were able to determine that trait and social influence components of perceived support were related to favourable affect and to self-esteem. They concluded that social support interventions and theories should include both trait and social mechanisms to alter and explain perceived support and psychological outcomes. Lakey, Cohen and Neely (2008) used multivariate generalizability analyses to investigate perceived support and relational effects in psychotherapy process constructs. The study involved therapy clients and students watching videos of therapists and then rating the expected supportiveness of the therapist and the expected therapy process constructs for each therapist. They found that there were strong relational effects in expected therapist supportiveness and therapy constructs. Both univariate and multivariate generalisability analyses can build upon previous social support research and may have theoretical and applied implications.

Qualitative Methods of Research

Qualitative research methods provide another approach to examining social support. Qualitative methodologies may provide insight into how athletes form their judgements of support. Silverman (2006) states that qualitative

measures provide rich, descriptive data that provides an insight into human experiences, such as their experiences of social support. An individual's description may provide a foundation for future research regarding the information used by perceivers to judge the supportiveness of support providers. According to Maxwell (1996), qualitative research is suited to five purposes: 'understanding the meaning, for participants in the study, of the events, stations, and actions they are involved with and of the accounts that they give of their lives and experiences.', 'understanding the particular context within which the participants act, and the influence that this context has on their actions', 'identifying unanticipated phenomena and influences and generating new grounded theory about the latter', ' understanding the processes by which events and actions take place, and developing causal explanations' (p.17-20). Using this criterion, research investigating perceptions of support are suited to a qualitative framework. Qualitative measures may be able to provide an in-depth analysis of how and why specific social interactions take place and what shapes an athlete's social support perceptions.

Kristiansen and Robert (2010) used qualitative interviews to examine how an Olympic youth team experienced both competitive and organisational stress during a competition. They found that the athletes relied on social support as a coping mechanism. They also provided evidence supporting "the importance of a good coach-athlete relationship in order to perform well and enjoy the competitive experience." (Kristiansen & Roberts, 2010,p. 686). Pre-dating this research, Bianco (2001) interviewed ten downhill skiers to investigate the role of social support during the recovery process from sport injury. Bianco (2001) found that the athletes required various types of support from medical staff, teammates, and their home support networks. These studies

demonstrate the effectiveness and reliability of investigating social support using qualitative techniques.

Structure of this thesis

This thesis is written as a series of interrelated research papers; studies one and four are written as separate chapters, however, studies two and three are written as a two-study chapter. Chapter one is an introduction to the thesis and provides an overview of the social support, mixed methods approaches and related topics. Chapter two addresses the need to utilise innovative techniques to examine social support, therefore, uses fMRI imaging to examine the neural effects of social support upon performance during a working memory task. Chapter three uses Generalisability theory to examine the information used by athletes to form their judgement of a coach's supportiveness. Chapter four uses qualitative methods to investigate the information used by athletes to form their perceptions of a coach's supportiveness. Chapter six is an overall discussion of the thesis. It reiterates the aims and key findings of the thesis, and demonstrates the theoretical and applied implications of the preceding chapters. A discussion of the strengths and methodical limitations of the research, and provides focus for future research.

Aims and rational of this thesis and the comprising studies

The primary aim of the thesis was to examine social support in achievement contexts. This was done by examining both enacted and perceived support in varying environments. The previous literature review demonstrates the prevalence of social support research in a wide range of areas. The importance of social support has been established extensively; being associated with improved performance and both mental and physical health. Thus, it is clear than if the provision of social support or the perception of

support available can be increased, then a multitude of benefits can be induced. One of the current problems within social support research is a lack of understanding regarding how social support can be increased. Previous studies that have examined social support and have tried to increase social support have shown inconsistent results. Therefore the aim of this thesis was to gain a deeper understanding of social support in achievement contexts. The thesis consisted of four studies which will now be described.

Study one aimed to investigate how experimentally-manipulated social support affected brain activations during a working memory task. Previous research has suggested that social support can reduce the effect of stress (Maisel & Gable, 2009), thus reducing the negative effect stress has upon performance (Rees & Freeman, 2009). Specific areas of the brain have been associated with the stress response (Kellogg, 2012). The aim of this study was to use functional magnetic resonance imaging to examine how social support affects the stress response at a neural level. An fMRI approach to social support may have the potential to provide a more in-depth understanding of how social support influences the stress response.

Studies two and three aimed to understand how individuals form their judgement of support. Previous research has demonstrated that an athlete's perceived level of support can influence a range of outcome variables including self-confidence (Freeman & Rees, 2009), burn out (DeFreese & Smith, 2012), injury response (Bianco, 2001) and performance (Rees, Hardy, & Freeman, 2007). However, there have been some discrepancies in results when studies aiming to increase an athlete's level of perceived support do so using an intervention (Hogan, Linden & Najarian, 2002). Therefore, by using multivariate generalizability analyses (Cronbach, Gleser, Nanda & Rajaratam, 1972;

Shavelson, Webb & Rowley, 1989; Shavelson & Webb, 1991 Brennan, 2001) to examine perceived support at the perceiver, target and relational levels of analysis, the studies aimed to determine whether the personality of an athlete, the trait characteristics of a coach or the interaction between them both would influence how an athlete viewed the supportiveness of a coach.

Study four aimed to further examine how athletes form their judgement of a coach's supportiveness. By using qualitative research methods, the study aimed to find out more about the information athletes used when judging the supportiveness of a coach. Semi structured interviews guides developed using previous research by Lakey (2010) focused on how athletes judged the supportiveness of a coach. Lakey (2010) suggested that perceived similarity, similarities or complementarity in personalities, similar attitudes and beliefs may provide information to athletes regarding how supportive a coach is. This information could then be used to help understand how athletes judge the supportiveness of coaches, and may provide information regarding how coaches can develop their supportive behaviours and increase an athlete's level of perceived support.

Chapter 2: Study 1: The Potential Neural Mechanism Underlying the Effect of Social Support on Performance Outcomes.

Abstract

Despite the extensive research demonstrating the positive influences of social support, we are yet to fully understand the mechanisms underpinning the effects of social support. The present study used neuroimaging techniques to examine the neurological activity of social support during a stressful, competitive working memory task. The study involved 28 participants who were placed into two groups: non-support group and support group. The support group were given a support manipulation prior to the task. All participants completed self-report measures of self-efficacy (Bandura, 1997), positive and negative emotions (PANAS, Watson, Clark & Tellegen, 1988), stress (SAM, Peacock & Wong, 1990), and thought occurrence (TOQS, Hatzigeorgiadis & Biddle, 2000). Participants' performance of the working memory task was measured, in addition to brain activations. Statistical analyses showed that there were no significant differences in performance between the two groups. The non-support group displayed significantly higher activations in the cingulate gyrus, a part of the anterior cingulate cortex, at the highest level of task difficulty (three-back task). This is an area associated with the initial stress response, however, other areas more commonly associated with stress response such as the amygdala and HPA axis were not activated. In conclusion, the current study provides inconclusive results as to how social support influences the stress response at a neural level. Further research should be conducted into perceptions of support given some individuals ($n=2$) in the support group did not report that they felt support was available to them and some individuals ($n=10$) in the non-support group reported that support was available to them.

Introduction

Social support has been extensively researched in a wide variety of domains including sport, nursing, teaching, education, medicine, mental health and military. Within these domains social support has been associated with a variety of performance related variables such as self-confidence (Freeman & Rees, 2010), stress (Cohen & Wills, 1985) and self-efficacy (Cowan, Slogrove & Hoelson, 2012). Despite these established links, we are yet to fully understand the mechanisms underpinning the influences of social support, preventing the development of consistent and successful interventions.

One variable associated with social support that has been comprehensively investigated is stress. Stress has been shown to have a detrimental effect upon mental health (Lupin, McEwenn Gunnar & Heim, 2009), well-being and performance (Rathschlag & Memmert, 2013), consequently, reducing the negative effects of stress is vital. There have been various approaches to researching the influence of social support upon stress. Rees and Freeman (2009) examined the relationship between social support and objective task performance. They collected data from 197 participants. The participants completed measures of stressors, social support and self-efficacy prior to performance. They found that social support moderated the relationship between stressors and task performance. Previous studies have highlighted how individuals who experience or are given more support experience lower levels of stress (Hostinar, Sullivan & Gunnar, 2013; Maisel & Gable, 2009; Eisenbeger et al, 2007). Social support may be beneficial as individuals with high levels of support, or those that are given support within an experimental laboratory environment will experience lower levels of stress or may appraise a situation as less stressful. Therefore, further information regarding the

underlying mechanisms of the effects of social support upon stress is particularly important. One approach that can provide insight into the mechanisms underlying the relationship between social support and stress is the neurocognitive approach.

Social neuroscience combines biological and social research in order to examine the biological underpinnings of social events. Neurocognitive methods include imaging techniques such as functional Magnetic Resonance Imaging (fMRI) to examine brain activity during specific conditions. fMRI works by examining changes in blood-oxygen level-dependent (BOLD) signals in different regions of the brain. These changes in blood oxygenation are directly associated with changes in brain activity. Thus, enabling the identification of brain regions related to specific stimuli or conditions. By applying neurocognitive methods, a relatively new approach to social support research, we may be able to gain a deeper understanding of the mechanisms underpinning social support. Eisenberger et al. (2007) used neuroimaging techniques to examine the neural pathways linking social support to the stress response. They were able to identify specific neural regions associated with stress and how the activation levels of these areas were diminished through social support.

Previous research has identified brain regions associated with the stress response. The initial stress response has been associated with the amygdala, insular and anterior cingulate cortex (Eisenberger & Cole, 2012). Many studies have highlighted the role of the amygdala in the stress response (Hölzel et al., 2010), demonstrating that it modulates autonomic and neuroendocrine stress responses. Thus, if social support impacts the stress response by altering one's initial appraisal, then activations in the amygdala may be reduced. The

amygdala shares reciprocal anatomic connections with the insula (Augustine, 1996), which has been associated with the identification of the emotional significance of a stimulus and the production of an affective state (Phillips, Drevets, Rauch & Lane, 2003). The insula has been associated with perceiving and organising autonomic responses to aversive or threatening stimuli. Phillips et al. (2003) suggested that the insula may convey the representation of aversive sensory information to the amygdala, potentially implicating it too in the initial response to stress.

The anterior cingulate cortex (ACC) has been associated with the stress response (Etkin, Egner & Kalisch, 2011; Shin, Whalen, Pitman & Rauch, 2009). The ACC is a region of the cingulate gyrus, located in the cingulate cortex. The cingulate gyrus is a large gyrus situated medially in the central hemisphere that surrounds the corpus callosum. The cingulate gyrus contains cortical grey matter and the cingulum, a white matter bundle that runs within the gyrus, crossing into the parahippocampus cortex. The cingulum links different cingulate sub-regions and has projections into the medial temporal region (Nieuwenhuys et al., 2008).

Devinsky, Morrell and Vogt (1995) explained that the ACC is a part of a range of central neural networks, thus making it difficult to determine its function. The anterior cingulate cortex (ACC) has been identified as a component of emotional networks (Devinsky, Morrell & Vogt, 1995; Vogt, Finch & Olson, 1992). Lesions to the ACC have been found to cause anxiety (Angelini, Mazzucchi, Picciotto, Nadocci & Broggi, 1981; Levin & Duchawny, 1991), implying that the ACC may have a role in producing the stress response. Shin et al. (2000) found that blood flow and activation increases within the subgenual and pregenual anterior cingulate gyrus during mood induction when

compared with resting state, suggesting that it has a role in the initial stress response. The association between the ACC and the initial stress response appears robust, and a decrease in ACC activity following a social support intervention may be an indication that social support influences the primary appraisal of a stressor.

Rees and Freeman (2009) found that individuals with low levels of perceived social support were more vulnerable to stress. Therefore, the current study utilised individuals with lower levels of perceived support in order to observe the effects of social support upon stress.

Previous research has identified a link between social support and performance. Rees and Freeman (2009) found that when stressors were relatively high, social support was associated with higher levels of performance through its positive relationship with self-efficacy. Beehr, Jex, Stacy and Murray (2000) examined the effects of support from co-workers on work stressors and job performance. They found that social support predicted psychological strains, but was only weakly related to performance. In addition they stated that there was no evidence that social support moderated the effects of stress. Contrary to this, Gunster and Germeyns (2012) found that social support improved 'in-role' performance. A neurocognitive approach may provide insight into how social support effects performance, and reveal information about the underlying mechanisms.

The aim of the present study was to investigate how experimentally-manipulated social support affected brain activations during a working memory task using fMRI imaging. The task was conducted in a competitive manner which individuals' performance would be recorded, increasing the amount of stress for the participants. The working memory task increased in difficulty

throughout three levels, increasing the amount of stress on the participants. Neural activity, stress appraisal and performance were measured. We hypothesised that the following would occur: a) Participants in the support condition, when compared to a non-support group, would have less activity in areas such as the cingulate cortex, amygdala and insula, which have previously been implemented in the initial stress response; b) Participants who were provided with support, when compared to a non-support group would perform better on the cognitive task; c) Participants in the support condition, when compared to a non-support group, would perceive the task as more of a challenge and less of a threat; d) Participants in the support group would report that support was available to them and participants in the non-support group would report that support was not available to them.

Method

Participants. 200 hundred first year undergraduate students from the University of Exeter completed the revised 12-item social provisions scale (Cutrona & Russell, 1984; Lakey, McCabe, Fisicaro & Drew, 1996). 28 participants with the lowest perceived support scores were invited to participate in an fMRI cognitive task.

Procedure. The study received institutional ethical approval and all participants were required to complete a safety screening form to ensure their suitability for the fMRI scanner as well as a generic informed consent form. Participants were informed that there would be financial prizes for the top four scoring individuals of the cognitive task: 1st place: £40, 2nd place: £20, 3rd place: £10 and fourth place: £5. The participants were randomly assigned to a support or non-support group (14 participants in each group). The non-support group were given instructions regarding the cognitive task they would be attempting

within the scanner, and were informed that they would not be able to ask for help during the task. The support group were given the exact same instructions. However, they were told the following:

‘As a university of Exeter student you are a very intelligent and capable individual and we are very confident that you will perform well. You will be able to talk to us via an intercom throughout the task so please feel free to ask any questions at any time. We will be happy to provide advice and feedback if you wish, and we will be happy to discuss any questions or concerns that you may have now, during the task, or afterwards.’

Following the experimental support manipulation, participants completed a selection of measures. Participants then entered the fMRI scanner in which further instructions and examples were given to the participant who then completed the task. After the task, a final questionnaire was completed by the participants.

Measures. ***Self-report data.*** ***Self-efficacy.*** Participants completed a measure of self-efficacy (Bandura, 1997). This involved participants rating how confident they were that they could complete each level of the task. They were asked to state ‘yes’ or ‘no’ to each band of scores with reference to whether they believed they could achieve a percentage score equal to or above the band of scores, for example ‘I can identify 1-10% of the targets correctly’. For those scores that were answered with ‘Yes’ participants were asked to rate how confident they were that they could achieve those scores. They were to rate their degree of confidence by recording a number from 0 to 100.

Emotions. Participants completed the Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988; Crawford & Henry, 2004), which involved participants rating on a scale from ‘Very slightly or not at all’ to

'Extremely', the extent to which they felt each emotion at that time. For example, emotions were included such as, interested, excited, upset, enthusiastic and irritable. The measure consisted of two sub-scales: positive affect and negative affect. Participants were asked to rate how much they felt an emotion using a Likert scale ranging from one (very slightly or not at all) to five (extremely).

Stress. The stress appraisal measure (SAM, Peacock & Wong, 1990) was completed in order to assess how participants viewed the task. The SAM contained 28 items concerned with participants' thoughts and feelings about various aspects of the task. Participants were asked to rate how they felt about the task using a scale ranging from zero (Not at all) to four (Extremely). Items included questions such as 'Is this a totally hopeless situation?', 'Does this task make me feel anxious?', 'How threatening is this task?' and 'Will I be able to perform well in this task?' The SAM uses six dimensions in which to measure stress. These include 'Threat' "*the potential for harm/loss in the future*" (Peacock & Wong, 1990. p228), 'Challenge' "*reflects the anticipation of gain or growth from the experience*" (Peacock & Wong, 1990. Pp.228), 'Centrality', "*perceived importance of an event for one's well-being*" (Peacock & Wong, 1990. Pp.228), 'Controllable-by-self', 'Controllable-by-others and 'Uncontrollable', "*the extent to which the situation is controllable-by-self, controllable by others and uncontrollable-by-anyone*" (Peacock & Wong, 1990. Pp.228). Threat, challenge and centrality are described as anticipatory stressors. Controllable-by-self, controllable-by-others and uncontrollable-by-anyone are described as 'perceptions of control'. The final dimension that the SAM includes is stressfulness, which refers to the overall perceived stressfulness of a task or situation.

Thought Occurrence. After completing the task participants were asked to complete the Thought Occurrence Questionnaire for Sport (TOQS, Hatzigeorgiadis & Biddle, 2000). This measure asked the participants to reflect on the task that they had just performed, and to identify certain thoughts that they may have had during the task. Participants were asked to rate how frequently they experienced each thought (on a scale from never (one) to very often (7)), how distracting these thoughts were (on a scale from not at all (1) to very distracting (7)) and how this affected the amount of effort they put into completing the task (on a scale from made me give up trying (-3), through neutral (0), to made me try harder (3)). Items included statements such as 'During the task I had thoughts that I want to quit', 'During the task I had thoughts about previous mistakes I have made', 'During the task I had thoughts about personal worries (e.g. work, relationships)', and 'During the task I had thoughts that I am not going to perform as well as others'.

A task manipulation check was added to the TOQS questionnaire to ensure that the support manipulation conducted with the experimental group had been successful. This included the following items: 'During the task someone was available to provide me with advice and guidance?', 'During the task someone was available to provide me with encouragement and boost my confidence?' and 'During the task support was available to me?'

Statistical analysis of self-report data. Self-report data was analysed using independent t-tests which compared the means of the two groups for each of the measures listed above.

Performance. The n-back task was used to invoke a social-evaluative threat and relative uncontrollable (Dickerson & Kemeny, 2004) environment. The n-back task involved the participant identifying whether the present letter

was the same as the one presented in trials previously. The present study included: one-back, two-back and three back tasks. The n-back tasks were completed using E-prime software (Psychological Software Tools, version 1.1). The one-back task involved participants indicating whether the current letter on the screen was the same as the previous letter, for example A A. The two-back task was similar, however, the participant needed to indicate if the current letter was the same as that which was previous to the last letter, for example, B A B, the current letter would be the same as the previous to last letter making the current letter a target letter. The third task involved the participant indicating if the current letter was the same as that which was three letters back, for example, B A C B, the current letter would be the same as that which is three letters back and would therefore be a target letter. The task was viewed on a screen placed at the foot of the scanner via a mirror mounted on the head coil. Each letter was presented for one second. A button, placed in each of the participants hand was used to indicate whether the present letter being viewed was a target letter or not. The timing of the task would allow sufficient time for the BOLD (Phan et al., 2004) response. Performance was measured by calculating the number of correct responses to each of the three tasks. A correct response involved identifying if the current letter was a target letter.

fMRI data acquisition. Structural and functional imaging was performed on a 1.5-T Phillips Gyroscan magnet equipped with an 8-channels Sense coil. A T2*-weighted echoplanar imaging (EPI) sequence was used for fMRI (TR=3000 ms, TE=50 ms, flip angle= 90°, 37 oblique transverse slices in ascending order and voxel size=3x3x3 mm). A total of 335 volumes were acquired for each participant. An additional 3 “dummy” scans were performed before each run

prior to the stimulus sequence. A T1-weighted structural MRI scan was also acquired (TR 25ms, TE 4.1ms, 160 axial slices, voxel size 1.6×0.9×0.9 mm).

fMRI imaging. fMRI data analysis was carried out using SPM8 Software (www.fil.ion.ucl.ac.uk/spm) using an approach based on General Linear Models (GLMs).

Analysis of the data is undertaken in two stages: first level analysis and second level analysis.

Firstly, an assessment is carried out on the single subject level (First level analysis) to determine those voxels which show signal intensity changes which correlate with the time course of the stimuli presentation. Subsequently, group analysis is undertaken, to generate ‘second level’ statistical maps which show regions which are statistically consistently activated in participants. In order to analyse the data the following steps must be followed: (1) pre-processing of the fMRI data (2) specification of the GLM design matrix (3) estimation of GLM parameters via the application of the design matrix to the fMRI data using a classical approach and the determination of Statistical Parametric Maps (SPMs) illustrating those voxels which show statistically significant activation (4) group analysis. A description of each step follows:

1. Pre-processing of the fMRI data. The fMRI images were initially pre-processed which is comprised of: slice-time correction, realignment, normalization and smoothing:

Slice timing. The functional images of the brain are collected in slices. However, the slices are collected sequentially rather than simultaneously. This can result in differences of up to a few seconds in acquisition times between slices. Because the SPM model examining the correlation between voxel signal intensity changes and stimulus times assumes all slices are acquired

simultaneously a correction process is required so that each voxel's intensity is time shifted to match a reference slice.

Realignment. The movement of the subject's head during the functional scan is a significant problem, as the fMRI analysis procedure requires assessing the time course of signal change on a voxel by voxel basis. It is therefore necessary to correct for any movement such that the subject's head can be assumed to occupy the same spatial coordinate location throughout the experiment. This is done by assuming the movement does not change the shape and the size of the brain allowing it to be treated as a rigid body. The position of any voxel in the brain can be identified by three coordinate values (x, y, z) with the movement of a rigid body characterizing by six parameters- three translations along x, y and z and three rotations about x, y and z. Acceptable movement parameters for participant inclusion were defined as 4 mm for transition and 4° for rotation.

Normalization. There is a huge variation in the shape and the size of the brain across individuals. These differences would lead to a mismatching of active regions between individuals within any kind of group analysis if such variations were ignored. Therefore, it is necessary to register all individual's functional images to a standard brain via a procedure known as spatial normalization. The most commonly used brain template was created by the Montreal Neurological Institute (MNI) with all anatomical locations within that brain specified by their MNI xyz coordinates.

SPM transforms the MRI images to the MNI template by moving their spatial location so that the images and template overlay each other. Subsequently the fMRI images are distorted e.g. stretched and twisted so that specific anatomical markers occur at the same position.

Smoothing. Smoothing is carried out in order to minimize the noise in fMRI data and increase the signal-to-noise ratio (SNR). It consists of ‘blurring’ the data i.e. decreasing the image resolution and as well as improving SNR it leads to improved group analysis statistics as small scale anatomical variations between individuals are reduced in significance.

2. Specification of GML design matrix from the processed data. The design matrix presents the time course of the stimuli and blood flow changes these are predicted to initiate using a canonical hemodynamic (hrf) with time derivatives and comprises one row for each scan and one column for each stimulus.

3. Estimation of GLM parameters and Parametric Map

Determination. Model parameters are estimated using classical (ReML – Restricted Maximum Likelihood) algorithms. Once the model parameters have been estimated, single subject analysis is implemented to determine individual statistical parametric maps.

4. Group analysis. Second level or group analysis involves analyses being conducted in order to examine any differences between the two groups. A ‘method of subtraction’ (Kellogg, 2012) was used. This involved neuroimages being obtained for both the support and non-support groups. One group’s image is then subtracted from the other groups image, leaving only the neural activity associated with social support. Independent group t-tests were conducted, producing t-contrast images for each test comparison. A random effects analysis was performed in order to establish which voxels showed consistent activations across all subjects between the support and non-support groups. An uncorrected statistical threshold of $p < 0.001$ and a voxel cluster threshold of 8

were used. An Atlas by Talairach and Tounoux (1998) was used in order to establish voxel activation locations in the brain.

Results

Brain activations. In order to examine which neural regions were influenced by the social support, analyses were conducted to identify areas of the brain which were activated in the support and non-support groups. When the support and non-support group were compared, there were no significant differences in brain activations between the two groups during the one-back and two-back tasks. However, during the three-back task, in line with hypothesis A, there were significant differences between the two groups ($p<0.001$, 5 voxels). Table 1 shows the areas of the brain that were activated during the three-back task in the support and non-support groups. Within the table are the brain regions, the MNI coordinates, cluster size (size of activation) and t-stat. Participants in the non-support group showed significant activations in the cingulate gyrus, of the cingulate cortex (an area associated with the stress response). In addition the superior frontal gyrus (an area associated with the working memory) and precentral gyrus (an area associated with body movements) showed significant activations. Participants in the support group showed significant activations in the transverse temporal gyrus (also known as Heschl's gyrus), part of the primary auditory cortex implemented in auditory processing (Warrier et al., 2013).

Table 1. Brain regions activated during the three back task ($p<0.001$, 5 voxels).

Group*	Region	Brodmann's Area	MNI			Cluster	t- stat
			Coordinates				
NS	Cingulate Gyrus	24	-15	14	34	7	4.63
	Cingulate Gyrus		15	-7	49	1	3.70
	Superior Frontal Gyrus	10	24	50	4	1	3.63
	Precentral Gyrus	6	63	-13	34	2	3.54
S	Transverse Temporal Gyrus		-63	-10	13	5	3.57

*Group comparisons showing the peak activations and brain regions.

**Cluster size (k) refers to the number of voxels in each activates cluster. The size of each voxel is $3.125 \times 3.125 \times 3\text{mm}^3$.

Performance data. Performance was measured by recording the number of times a participant correctly identified a target letter during each of the tasks. To assess how the increasing difficulty of the tasks influenced performance a two-way mixed model ANOVA was conducted. Mauchlys test of sphericity was met (.975). Contradicting hypothesis B there were no significant main effects for groups, $F(2)=1.19$, $p>0.001$. There was no significant interaction effect between groups and performance, $F(2)=.818$, $p>0.001$. However, there was a significant main effect for the level of complexity of the task, $F(2)=34.18$, $p<0.001$. Pairwise comparisons showed that participants scored significantly higher on the one back task (Non-support group: $M= 26.93$, $SD = 3.85$. Support group: $M= 24.71$, $SD= 7.66$) than the 3 back task (Non-support group: $M=21.14$, $SD = 6.07$. support group: $M= 19.36$, $SD= 6.46$), and that there were no differences in performance between 1 back task (Non-support group: $M= 26.93$, $SD = 3.85$). Support group: $M= 24.71$, $SD= 7.66$) and performance of the 2 back task (Non-support group: $M= 26.07$, $SD= 4.65$.

Support group: $M= 22.57$, $SD= 8.62$). There was a significant difference between the performance of the 1 back task (Non-support group: $M= 26.93$, $SD = 3.85$) and the 3 back task (Non-support group: $M=21.14$, $SD = 6.07$. support group: $M= 19.36$, $SD= 6.46$), and the 2 back task (Non-support group: $M= 26.07$, $SD= 4.65$. Support group: $M= 22.57$, $SD= 8.62$) and the 3 back task (Non-support group: $M=21.14$, $SD = 6.07$. support group: $M= 19.36$, $SD= 6.46$).

Self-Report data. Table 2 shows the means and standard deviations of the self-report data for both groups. Measures of perceived social support, positive and negative emotions, stress appraisal, task self-efficacy and thought occurrence were analysed. Initial independent t-tests were conducted to compare the means of the two groups for the above variables. In accordance with hypothesis C the task was appraised as more of a challenge by the support group ($M=12.07$, $SE=.55$) than the non-support group ($M=10.43$, $SE=.75$). This difference, -1.64, 95% CI[.27, .38], was not significant ($t(26)=1.77$, $p = .88$), although, offers weak evidence of a difference between the groups. In addition the support group ($M=12.5$, $SE=.86$) viewed the task as being controlled by others more so than the non-support group ($M=10.14$, $SE=.72$). This difference, -2.36, 95% CI[.05, 4.66], was significant ($t(26)=2.10$, $p = .05$).

All other self-report analyses showed to be non-significant.

Table 2. The mean scores and standard deviations of the self-report data.

Variable	Support Group		Non-Support Group	
	M (SD)		M (SD)	
Perceived Social Support	44.14	(7.01)	47.29	(6.73)
Positive Emotions	3.14	(.49)	2.89	(.51)
Negative Emotions	1.65	(.62)	1.52	(.22)
Stress Appraisals				
Threat	6.07	(1.54)	7.21	(2.29)
Challenge	12.07	(2.05)	10.43	(2.79)
Centrality	6.36	(2.17)	5.36	(.93)
Control Self	13.99	(3.22)	13.71	(4.20)
Control Others	12.50	(3.23)	10.14	(2.68)
Uncontrollable	6.07	(2.30)	6.57	(3.03)
Thought Occurrence				
Frequency	38.57	(9.26)	37.21	(13.99)
Distraction	36.29	(10.28)	36.29	(9.83)
Effort	11.50	(13.01)	10.36	(11.69)

Note. M = Mean, (SD) = Standard deviation.

Manipulation checks. Twelve of the fourteen participants in the support group reported that they felt supported during the task. Ten of the fourteen participants in the non-support group reported that they felt supported during the task. These results do not support hypothesis D.

Discussion

The aim of the present study was to investigate how experimentally-manipulated social support affected brain activations and performance during stressful conditions. The non-support groups showed higher activations than the support group in regions associated with stress, working memory and motor control. The higher activations observed in an area associated with stress provides some support for hypothesis A. Opposing hypothesis B, there was no significant differences between the two groups in performance. The self-report data showed that as stated in hypothesis C, the support group viewed the task as more of a challenge than the non-support group. In addition, the self-report data showed that the support group felt that the task was controlled by others more than the non-support group. The results showed that as the difficulty of the task increased, so did brain activations in the working memory.

Hypothesis A stated that individuals in the non-support group when compared with the support group would demonstrate lower activations in the amygdala, insula and ACC. The results of the current study did not fully support this hypothesis. During the three back task some differences were observed between the support and non-support groups; the non-support group showed increased activations in the precentral gyrus (BA 6), the superior frontal gyrus (BA 10) and the cingulate gyrus (BA 24). The precentral gyrus contains the primary motor cortex which is responsible for the neural impulses that control collateral body movements (Barnes, 2013); therefore these activations can be

disregarded given this was not the focus of the study. The superior frontal gyrus has been associated with working memory (Barber, Caffo, Pekar & Mostofsky, 2013; Boisgueheneuc et al., 2006); activity in this region would be expected given the nature of the n-back task.

The cingulate gyrus, located within the cingulate cortex has received much attention given its regular appearance in fMRI studies. There has been some debate surrounding the function of the cingulate cortex, due to the various studies implicating the region (see Medford & Critchley, 2010; Luu & Posner, 2003). The anterior part of the cingulate cortex (ACC) has been found to be positively influenced by increased levels of social support; Eisenberger et al. (2007) conducted a study examining the neural pathways linking social support to attenuated neuroendocrine stress response. They found that individuals who had reported interacting with close and supportive individuals daily had less brain activity in the dorsal anterior cingulate cortex during a social rejection task. Participants in the non-support group displayed more activity in the ACC suggesting that participants in the support group may have experienced less activity in the ACC and thus experienced less stress. Shin et al. (2000) stated that the anterior cingulate gyrus was implicated in the negative emotional response supporting current findings.

Previous research and literature states that the physiological response to stress involves the hypothalamic-pituitary-adrenocortical (HPA) axis (Hostinar, Sullivan & Gunnar, 2013). The HPA axis works in conjunction with other regions; Joël and Baram (2009) have described this as a “neuro-symphony of stress” (pp. 459). The hippocampus, prefrontal cortex and amygdala have all been implicated in the stress response (Hostinar et al., 2013). The amygdala has been associated with the response to fearful stimuli (Gloor, 1992; Scott,

Young, Calder, Hellawell, Aggleton & Johnson, 1997; Davis & Whalen, 2001).

The central nucleus of the amygdala plays an important role in emotional and stress integration (Ulrich-Lai & Herman, 2009). Given the prominence of the amygdala in stress response research it is surprising that no activations were observed in this area in the present study.

The amygdala shares reciprocal anatomic connections with the insula (Augustine, 1996), which has been associated with the identification of the emotional significance of a stimulus and the production of an affective state (Phillips, Drevets, Rauch & Lane, 2003). The insula has been associated with perceiving and organising autonomic responses to aversive or threatening stimuli (Phillips et al., 2003). Furthermore, Phillips et al. (2003) suggested that the insula may convey the representation of aversive sensory information to the amygdala, potentially implicating it in the initial response to stress. Again, it is unexpected that the current study did not detect any activations in this area.

In addition to the lack of activations witnessed in these integral areas, the activations that were present in the cingulate gyrus could be considered weak as previous research has found larger and stronger voxel activations. For example, Eisenberger et al (2007) found that social support was negatively correlated with the dACC and Brodmann's area 8. Eisenberger et al's (2007) study used significance levels of $p < 0.005$, whereas the current study used a lower significance level of $p < 0.001$. Moreover, Eisenberger et al's (2007) study found that the dACC had a cluster size of 13 and that Brodmann's area 8 had a cluster size of 59. These are much larger clusters than those found in the current study as the voxel size being measured in Eisenberger's (2007) study was set at ten voxels, whereas the current study was set at five voxels.

The findings of the current study provide inconclusive support for hypothesis A. Despite the lack of activations in multiple areas, it should be noted that there were still significant activations in the cingulate gyrus. Previous research has suggested that social support may reduce the negative effect of the initial stress response by the release of opioids and endogenous opioids which occurs during social contact (Panksepp, 1998). These opioids can have analgesic and stress-reducing effects (Drolet et al., 2001; Panskepp, 1998). Past studies examining the effects of support on stress have shown that support moderated the effects of stress (Rees & Freeman, 2009), however it was unclear as to how. The current findings provide some further information regarding social support and the stress response by implying that the cingulate gyrus may have some role in the process; however, it does not provide explicit evidence that the cingulate gyrus plays a significant part in the stress response or is altered by the provision of social support.

Surprisingly, hypothesis B was not met; hypothesis B stated that participants who were provided with support, when compared to the non-support group would perform better on the cognitive task. A two way mixed model ANOVA showed that there were no significant differences in performance between the two groups. It may be suggested that participants in the non-support group were investing more brain resources than the support group, given the increased neural activity, yet were performing at the same level; however, further investigation is required into how other neural resources may be utilised and the possible damaging effects of engaging more resources. Although some previous studies have shown that support can improve performance (Cutrona, Cole, Colangelo, Assouline & Russell, 1994) there has been inconsistent results displayed when examining the effects of support

interventions (Hogan et al., 2002). In a seminal paper Hogan et al (2002) reviewed and evaluated one hundred studies that used various interventions aimed at increasing support. They categorised interventions into different classes ranging from group interventions that provided support through family members and/or friends to individual interventions that provided support through professionals to studies that made comparisons between different types of support treatment structures. They found that support provided by friends and/or family members was beneficial. In addition they found that support skills training was beneficial. Furthermore, they observed that interventions that emphasized reciprocal support (individuals receiving and giving support) were particularly encouraging. These findings provide some explanation regarding hypothesis D.

The results of the study did not support hypothesis D; the manipulation check within the self-report data showed that some participants in the non-support group reported being given support, and some participants in the support group reported that they felt unsupported. This has significant implications to the study; individuals in the support group who did not identify that they had support either available to them or given to them may not have experienced the benefits of support. This perceived lack of support could provide some explanation as to why support did not influence task performance or the stress response in the predicted way. Taking into consideration that individuals within each group were provided with identical information, the results suggest that the participants interpret information differently, or that they use different information when judging the supportiveness of a support provider. Lakey (2010) stated that individuals do in fact use different information when judging the supportiveness of a support provider. Lakey and Lutz (1996)

suggested that individuals may use information such as perceived similarity when judging the supportiveness of a support provider.

Additionally, Lakey (2010) has explained that an individual's personality may play a part in how they judge the supportiveness of another. The notion that the trait characteristics of the perceiver, the objective characteristics of the provider and the unique interaction between the perceiver and provider all play a part in how an individual forms their judgement of support has been proposed by Lakey, Lutz and Scoboria (2004). This would imply that the support manipulation in the current study may not have been effective. Furthermore, it implies that the perception of support may be more influential in reducing the stress response than the actual receipt of support; meaning that knowing someone is there for you if you need them is enough of a buffer against stress, without eliciting or receiving support.

Another explanation for the differences in how individuals within the groups' perceived support could be that perceived support is influenced by the support provider. Similar to the suggestions made by Lakey and colleagues (Lakey, 2010; Lakey, Lutz & Scoboria, 2004; Lakey et al 2002), previous research has found that the effectiveness of a support intervention can be affected by who the support provider is in relation to the perceiver (Kors, Linden & Gerrin, 1997). Taylor et al (2010) examined the effects of a supportive and unsupportive audience on the biological and psychological responses to stress; they found that there were no significant differences in the stress response when a supportive or unsupportive audience was used. They posed the question: does a supportive audience of strangers have the same effect as a supportive audience made up of known friends and families? Christenfeld et al (1997) found that the presence of friends in a supportive role led to a reduction

in cardiovascular reactivity to stress, when compared to a stranger providing support. Hogan et al (2002) suggest that support interventions should be focused on using someone that has a natural role in an individual's support network.

The information provided by this study is greatly important, for example, social support is currently used as an intervention strategy in a wide variety of domains, for example trauma (Helgeson & Cohen, 1996; Taylor, 2007) and mental health (Salter, Foley & Teasell, 2010). The current study shows that support may not be an effective intervention when trying to increase performance and that it may even be detrimental to performance. Thus, it seems increasingly important to further our understanding of how a support judgement is formed as this may enable support interventions to be designed in a more effective way.

Limitations exist in the study which should be addressed in future research. The first limitation is that the results have a lack of generalisability; the cognitive task was very specific and brain activations will differ significantly depending on the task, for example cognitive task and motor task. Thus, responses may differ greatly if an individual was to experience a different form of stress, such as physical stress. A second limitation is that SPM analysis software shows significant clusters of activated areas above a significance level of 0.001 in order to remove 'background' noise such as a participant consciously pressing a button. Consequently, other areas may be active, though not above the significance level, meaning that some important active areas may have been unrecorded. A third possible limitation of the study is that not all of the participants that took part had low perceived social support when compared to a general population. This limitation may have influenced the effect

of the support manipulation as according to Rees and Freeman (2010), support interventions will be more successful with individuals who have low levels of perceived social support.

Future researchers may wish to examine the timings of social support interactions, the nature of the support, and whether there are any benefits as a provider to being supportive. For example, Inagaki and Eisenberger (2012) examined the neural correlates of giving support to a loved one and found that social support may be beneficial to both the recipient and provider of support. In order to understand how support interventions can be designed for larger populations, we must first deepen our understanding of how support judgements are formed. It would be beneficial for future research to explore the information used by individuals to form their judgement of support. Lakey (2010) described three components which may shape the way in which an individual forms their perception of support; these included: the perceiver, target and relational components. More information regarding these components and how individuals perceive support may further the development and enhance the effectiveness of support interventions.

Overall, this study has showed that the cingulate gyrus may have a role within the stress response, although further evidence is needed. The study demonstrates that support interventions may not always be effective and thus more research is required into how individuals judge the supportiveness of a support provider. By gaining a more in-depth understanding of how an individual's perception of support is shaped more effective interventions can be developed.

Chapter 3: Studies 2 & 3: Two Multivariate Generalisability Studies

Examining Perceived Support in the Coach-Athlete Relationship.

Abstract

Although high levels of perceived social support have been associated with high levels of performance, little is known about how athletes form their support judgements. This chapter contains two studies that aimed to (1) examine perceptions of coach support at perceiver, target and relational levels of analysis; and (2) investigate how perceived coach support is related to self-efficacy, self-confidence, anxiety, excitement, dejection, happiness and anger at each of these three levels.

Univariate generalisability analysis demonstrated that perceiver and relational components accounted for significant variance in support perceptions, but that the target component did not. Multivariate generalisability analysis was then used to calculate correlations between perceived coach support and the dependent variables of interest at the perceiver and relational levels of analysis. At the perceiver level, social support correlated significantly ($p<.05$) with self-efficacy, excitement and happiness, but not anxiety, dejection and anger. At the relational level, support was significantly correlated, in a positive direction, with excitement, happiness, and self-efficacy, and, in a negative direction, with anxiety, dejection, and anger.

Generalisability methods demonstrated that the primary predictor of an athlete's perceptions of coach support is the relational component, and that perceived support is consistently correlated with key outcome variables at the relational level. Therefore, the unique relationship that develops between an athlete and a support provider needs further investigation to identify what

factors or variables may ultimately lead to the development of such support perceptions.

Introduction

Coaches are often described as being a primary support provider (Hassell, Sabistan & Bloom, 2010; Kristiansen & Roberts, 2010; Bianco, 2001; Alfermann, 2000), yet we currently lack a sufficient understanding of how athletes judge the supportiveness of their coaches. Given that perceived support has previously been associated with improved performance (Freeman & Rees, 2009; Gould, Greenleaf, Chung & Guinan, 2002) and numerous other key psychological outcome variables, including performance-related factors in tennis (Rees & Hardy, 2004), competitive stress (Crocker, 2002) , organisational stress (Kristiansen & Roberts, 2010), burnout (Gould, Tuffey, Udry & Loehr, 1996) and injury (Mitchel, Evans, Rees & Hardy, 2013), it is imperative that a deeper understanding is gained of (a) how athletes judge the supportiveness of coaches and (b) how the way in which an athlete judges the supportiveness of a coach affects the relationship between perceived support and performance outcome variables such as self-confidence, self-efficacy and emotions.

Social support consists of three sub-components: social integration, enacted support and perceived support. Social integration refers to “The number of different types of relationships in which recipients participate (e.g., spouse, siblings, children friends)” (Lakey, 2010, p. 3). Enacted support refers to “Specific helping actions (e.g., advice, reassurance, tangible assistance) provided by family and friends during stress” (Lakey, 2010, p. 3). Perceived support refers to “A support recipient’s subjective judgement that friends and family would provide quality assistance during times of stress” (Lakey, 2010, p. 3). Research into the effects of social integration and enacted support remains unclear: enacted support has been shown to have either a negative relationship

or no relationship with psychological outcomes (Barrera, 1986; Finch, Pool & Ruehlman, 1999; Reinhardt, Boerner & Horowitz, 2006), and social integration has been inconsistently linked with psychological outcomes (Barrera, 1986). Perceived support has, however, been repeatedly associated with psychological, behavioural and physiological outcomes in a positive direction. For example, high levels of perceived support have been linked with injury (Judge et al., 2010), self-efficacy (Cowan, Slogrove & Hoelson, 2012) improved sporting performance (Gould et al., 2002) and increased self-confidence (Freeman & Rees, 2008; 2009). Despite the established links between perceived support and these variables, we are yet to fully understand how an athlete's judgement of coach supportiveness influences outcome variables. Thus the current study aimed to further this understanding by examining how perceived support influences a range of performance related outcome variables including positive emotions, negative emotions, self-confidence and self-efficacy.

There have been multiple approaches to examining perceived support. One of these approaches states that individuals form their support perceptions based upon the quality and quantity of the support they receive i.e. enacted support (Sarason, Sarason & Pierce, 1990). However, it has been shown that there is only 12% common variance between enacted support and perceived support, meaning that support from providers is not always perceived as supportive by recipients. Other researchers (see Lakey, 2010) have suggested that support perceptions are formed based upon the characteristics of the support provider. For example, an athlete would form their perceptions of a coach's supportiveness based upon the characteristics of the coach. Researchers have begun to apply generalisability analysis to examine how

support perceptions are influenced by the characteristics of the support provider, the trait characteristics of the perceiver and the relationship they share (see Lakey, 2010; Rees et al., 2012).

Generalisability theory (Cronbach, Gleser, Nanda & Rajaratam, 1972; Shavelson, Webb & Rowley, 1989; Shavelson & Webb, 1991 Brennan, 2001) enables researchers to examine how a support judgement is formed; whether it reflects the characteristics of the person making the judgement (*the perceiver*), the individual being judged (*the target*) or the unique relationship between the perceiver and the target. The perceiver component refers to trait-like tendencies of individuals in how they rate the supportiveness of all targets. For example, Athlete A may view all coaches as more supportive than Athlete B. The target component refers to the extent to which an individual's support judgements reflect the objectively supportive characteristics of the target. For example, Coach A may be perceived as more supportive than Coach B by all athletes. The relational component reflects systematic disagreement among perceivers that some targets are more supportive than others. For example, Athlete A may perceive Coach A to be more supportive than Coach B, whereas Athlete B may perceive Coach B to be more supportive than Coach A. In order to isolate the coach (*target*) component from the relational component, athletes must rate the same providers. In sport athletes are often in contact with multiple coaches (*targets*), presenting an ideal arena in which to apply generalisability theory. Given that coaches play an important role, and that support is an essential aspect of effective coaching (Bianco, 2001), research into how athletes form their judgements of a coaches' supportiveness is valuable.

When investigating the perceived supportiveness of coaches, Rees et al. (2012) found that the relational component was the most influential of the three

components, accounting for 35-44% of the variance; this was consistent with other studies examining perceived social support in general psychology (see Lakey, 2010). These variance figures suggest that the unique relationship between a support provider and a perceiver influenced the way in which the perceiver rated the supportiveness of the provider. In the present study, a similar approach was applied to the coach-athlete relationship, to determine how an athlete forms their judgement of a coach's supportiveness.

Building upon the work of Rees et al. (2012), the current research not only examined perceptions of support, but also used multivariate generalisability analyses to examine the link between perceived support and self-confidence, self-efficacy and emotions at the three levels of analysis. This method of analysis enabled us to examine these links at each of the perceiver, target and relationship levels. This information will deepen our current understanding of how perceived support influences outcome variables. Although studies have provided evidence linking perceived support and outcome variables including self-confidence (Freeman & Rees, 2010; Rees & Freeman, 2007), and self-efficacy (Cowan et al., 2012), they have not yet examined these links at the perceiver, target and relational levels. It will be informative to establish if social support correlates with these performance-related outcome variables at the different levels. This information will provide insight into how individuals form their perceptions of support.

Researchers in social psychology have produced various studies examining the effects of perceived support. One example is Neely et al.'s (2006) study, which examined the link between perceived support and positive and negative affect at each of the three levels. They found that greater perceived support was related to greater positive affect at the perceiver and

relationship levels of analysis, suggesting that outcome variables may be affected differently at the different levels of analysis. Performance related outcome variables are significantly important to athletes, thus, gaining an understanding of how perceived support interacts with these variables at each of the levels is essential.

The current research includes two studies examining athletes' perceptions of social support using generalisability theory. Both studies examined perceived support within the coach-athlete relationship and estimated correlations between perceived support and self-efficacy, self-confidence, anxiety, anger, dejection, excitement and happiness at the perceiver, target and relational levels of analysis. The first used a hypothetical approach, in which rugby union players rated the level of support they believed would be available to them if they were to work with the proposed rugby union coaches. The second study used a naturalistic environment in which to examine perceived support within the coach-athlete relationship. Previous researchers have found difficulty in finding natural environments in which they were able to isolate the perceiver, target and relationship components (Lakey, Lutz and Scoboria, 2004), given that there are not many situations in which a large group of people will be in contact with the same group of support providers. The second study overcomes this by using a martial arts training camp as the setting for the study. The martial arts camp involved multiple coaches working with multiple athletes repeatedly throughout the camp, providing a unique opportunity in which to isolate the perceiver, target and relational components. Based on previous findings (Rees et al., 2012; Lakey, 2010; Neely et al., 2006), it was hypothesised that both studies would find that: (a) the relationship component would account for the highest amount of variance in athletes' perceived

supportiveness of coaches, (b) positive emotions were likely to positively correlate with perceived social support at the relationship levels of analysis, (c) perceived social support would be positively associated with self-efficacy and self-confidence at the relationship level of analysis. As the design of the studies was essentially the same, all interpretations have been presented in one overall discussion, rather than being discussed separately.

Study 1

Method

Participants. Seventy male university rugby players volunteered to take part in the study. Ages of participants ranged from 18 to 45 ($M=23.71$, $SD=8.08$). 72.9% of the participants were British, 25.7 % identified themselves as English and 1.4% were Welsh/Tanzanian. The athletes provided information regarding how long they had been playing rugby; answers ranged from 2 years to 40 years, eight participants did not answer this item. Athletes were asked to provide information about the highest level at which they had played, 1.4% had played at international, 1.4% had played at Professional, 2.8% had played at semi-professional, 64.8 % had played at Divisional, 4.2% had played at county 7% had played at adult club, 14.1% had played at youth, 2.8% had played at school. Athletes also reported how many coaches they had worked with since they began playing rugby, answers ranged from 3 to 75. ($M=14.41$, $SD= 10.77$). The athletes were also asked to rate their knowledge of the coaches (ranging from 'No knowledge of them' to 'A detailed knowledge of them').

Selection of Targets. Athletes rated the same targets, in order to isolate the perceiver, target and relationship components. Athletes rated five famous

international coaches, all of whom had coached an international squad in a Six Nations Tournament.

Procedure. Participants attended a psychology seminar and were given the opportunity to volunteer to take part in the study. Participants were provided with a booklet containing an information sheet providing detail of the study and contact details of the researcher, and an informed consent form, and questionnaires.

Measures.

Perceived Support. Perceived support was measured using 9 items from the Pass-Q (Freeman, Coffee & Rees, 2010). These items included statements such as 'to what extent do you feel the coach would listen to your concerns?' they responded using a 5 point likert scale ranging from 0 'not at all' to 4 'extremely'. These questions reflected how athletes felt about the coach.

Emotions. Emotions were measured using the 22-item Sport emotions questionnaire (Jones, Lane, Bray, Uphill, & Catlin, 2005). Participants were asked to rate each emotion in regards to how they would feel if they were to work with this coach on 1-5 point likert scale ranging from 0 'not at all' to 4 'extremely'. The emotions assessed included anger, anxiety, dejection, happiness and excitement.

Self-Confidence. Self-confidence was assessed using 5 items from the CSAI-2R (Cox, Martens, & Russell, 2003) which involved participants rating how confident they would be if they were to work with the coach. For example 'I would be confident about performing well'. Participants responded to the 5 statements using a likert scale ranging from 0 'not at all' to 3 'very much so'.

Self-Efficacy. Self-efficacy was measured using 12 items designed using Bandura's guide efficacy scales (2010). The 12 items reflected specific

rugby union skills such as tackling and passing and items regarding more general sporting concepts such as ‘stay focused and ignore what’s going on around you’. Participants rated how confident they would be in their ability to complete a task or skill on a 5 point likert scale ranging from 0 ‘not at all’ to 4 ‘extremely’.

Statistical analyses. Univariate generalisability analysis was used to determine the extent to which athletes’ judgements of coaches supportiveness reflected the personality of the perceivers, the objective characteristics of the targets, and the unique relationships between perceivers and targets. Variance components were then calculated. Data were analysed as fully crossed, mixed ANOVAs with random factors. Test items and the target were within-subject factors, and participants (perceivers) composed the between-subject factor. Each participant was a level of the perceivers’ factor, each target was a level of the targets factor, and each item was a level of the items factor. To minimise measurement error, items were combined to compose two indicators for each construct (Lakey et al., 2004; Veenstra et al., 2011). This combined item factor was composed of the average of the odd items, and the average of the even items. Thus, the design for perceived supportiveness was a perceivers (50) x Targets (5) x items (2) fully crossed design.

Multivariate generalisability analysis (Brennan, 2001) was used to determine the correlations between perceived support and various outcome variables at the perceiver, target and relationship levels of analysis. The variables included: self-confidence, self-efficacy, anxiety, anger, dejection, excitement and happiness. Data were analysed using a p x h x i design (Brennan, 2001a).

Due to there being no standard test to determine population parameters, approximation bootstrapping was used to estimate standard errors.

Bootstrapping involves taking multiple resamples with replacements from the original data file. Conventional probability values were then established using z distribution in the normal approximation method. As the bootstrapping had to be conducted manually, comparatively few resamples were used; forty-nine resamples were used. ρ was calculated rather than the residual for each resample as all factors in the design were random (Mooney & Duval, 1993).

Standard deviation of the correlation distribution was used to estimate correlation standard errors. Multivariate generalisability values were considered significant when they were larger than $1.96 \times$ the standard error.

Results

Univariate generalisability analyses (shown in Table 3) found that the relational component accounted for the largest amount of variance in perceived support ($\sigma^2 = .20$, 95% CI: .20 to .20), accounting for 35.7% of the total variance in perceived support. The next largest variance component was for perceiver ($\sigma^2 = .19$, 95% CI: .10 to .27), accounting for 33% of the total variance in perceived support. The target component was not significant ($\sigma^2 = .08$, 95% CI: -.04 to .21), accounting for only 14.5% of the total variance of perceived support.

Table 4 shows the univariate generalisability analyses for anxiety, dejection, anger, excitement, happiness, self-confidence and self-efficacy.

Correlations between perceived support and self-confidence, self-efficacy, anxiety, anger, dejection, happiness and excitement at the three component levels are shown in Table 5. In accordance with Kenny (1994), multivariate analyses were not conducted at the target level as it was non-significant in the univariate analysis. At the relational level of analysis, social

support correlated significantly ($p < .05$) in a positive direction with excitement (.58, 95% CI: .47 to .69), happiness (.62, 95% CI: .48 to .78), self-efficacy (.58, 95% CI: .45 to .71) and self-confidence (.59, 95% CI: .50 to .67). There was also a negative correlation with anxiety (-.38, 95% CI: -.55 to -.20), dejection (-.39, 95% CI: -.57 to -.21), and anger (-.28, 95% CI: -.42 to -.11). At the perceiver level social support significantly correlated in a positive direction ($p < .05$) with self-efficacy (.64, 95% CI: .36 to .92), self-confidence (.51, 95% CI: .16 to .87), excitement (.36, 95% CI: .02 to .70) and happiness (.28, 95% CI: -.03 to .58). There was a significant correlation in a negative direction between social support and dejection (-.26, 95% CI: .46-.05), and anger (-.30, 95% CI: -.51-.10).

Table 3. Variance components, 95% intervals, and Percentage of Variance accounted for by perceived support.

	Perceiver			Target			Relationship		
	VC	95% CI	% of variance	VC	95% CI	% of variance	VC	95% CI	% of variance
Support	.187	.10-.27	33.0*	.082	-.04-.21	14.5	.202	.20-.20	35.7*

Note. VC = variance components, CI = confidence intervals. * denoted $p < .05$.

Table 4. Variance components, 95% intervals, and Percentage of Variance accounted for by anxiety, dejection, anger, excitement, happiness, self-confidence and self-efficacy.

	Perceiver			Target			Relationship		
	VC	95% CI	% of variance	VC	95% CI	% of variance	VC	95% CI	% of variance
Anxiety	.563	.35-.78	54.2*	.018	.02-.02	1.7*	.226	.16-.29	21.8*
Dejection	.421	.27-.57	69.2*	.01	-.01-.03	1.6	.099	.10-.10	16.3*
Anger	.353	.21-.49	45.7*	.013	.01-.01	1.7*	.072	.01-.13	9.3*
Excitement	.275	.15-.40	34.6*	.081	-.04-.20	10.2	.267	.21-.33	34.0*
Happiness	.426	.26-.59	42.3*	0	0-0	0	.218	.16-.28	21.7*
Self-Confidence	.171	.11-.23	36.1*	.056	-.03-.14	11.8	.187	.19-.19	39.5*
Self-Efficacy	.14	.08-.20	33.7*	.052	-.01-.11	12.5	.148	.15-.15	35.7*

Note. VC = variance components, CI = confidence intervals. * denoted $p < .05$.

Table 5. Multivariate Generalisability Correlations and Standard Errors at the Perceiver and Relational levels of Analysis

	Anxiety	Dejection	Anger	Excitement	Happiness	Self-Confidence	Self-Efficacy
Perceiver	-.03 (.16)	-.26* (.10)	-.30* (.10)	.36* (.17)	.28* (.16)	.51* (.18)	.64* (.14)
Relationship	-.38* (.09)	-.39* (.09)	-.28* (.08)	.58* (.06)	.62* (.07)	.59* (.04)	.58* (.07)

Note. * $p < .05$. – no correlation was calculated

Study 2

Method

Participants. Fifty (36 females, 14 males) martial artists attending a one-week long tae kwon-do training camp, volunteered to take part in the study. Ages of participants ranged from 15 to 55 ($M = 28.46$, $SD = 10.57$). The athletes provided information regarding their level of previous competition: (four

international, 25 national, seven regional, eight club level, five never competed).

Participants were asked to provide their grade (seven first kups, three second kups, one third kup, two fourth kups, one fifth kup, one seventh kup, one eighth kup, 12 1st dans, 10 second dans, six third dans, and four fourth dans).

Participants were asked to state their knowledge of each of the coaches (Coach A: no knowledge = four, little knowledge = 11, moderate knowledge = 23 and detailed knowledge = 12. Coach B: no knowledge = nine, little knowledge = 15, moderate knowledge = 12 and detailed knowledge = 14. Coach C: no knowledge = eight, little knowledge = 10, moderate knowledge = 18 and detailed knowledge = 14. Coach D: no knowledge = nine, little knowledge = 14, moderate knowledge = 17 and detailed knowledge = 10. Coach E: no knowledge = eight, little knowledge = 12, moderate knowledge = 19 and detailed knowledge = 11.)

Selection of targets. The targets in this study were 5 Tae Kwon-do instructors all fourth dans or above. They consisted of one female and four males, all of whom had extensive knowledge of Tae kwon-do and coaching.

Procedure. Participants attended a week long tae kwon-do training camp. The camp consisted of ten training sessions: one in the morning, one in the evening. During each 2 hour training session, participants were rotated so as to be coached by each instructor. On the fourth day of the camp, after having spent 12 hours training with the instructors, the participants were given an explanation about the study and provided with a booklet of questionnaires to complete. The booklet contained an information sheet and informed consent form.

Measures. Participants rated the supportiveness of the coaches, emotions, self-confidence and self-efficacy using the same measures as in Study one.

Statistical analyses. The statistical analysis used in Study one was repeated in Study two.

Results

Univariate generalisability analyses (shown in Table 6) found that the relational component accounted for the largest amount of variance in perceived support ($\sigma^2 = .29$, 95% CI: .23 to .35), accounting for 46% of the total variance in perceived support. The next largest variance component was for perceiver ($\sigma^2 = .14$, 95% CI: .05 to .22), accounting for 22% of the total variance in perceived support. The target component was not significant ($\sigma^2 = .08$, 95% CI: -.04 to .20), accounting for only 13% of the total variance in perceived support.

Table 7 shows the univariate generalisability analyses for anxiety, dejection, anger, excitement, happiness, self-confidence and self-efficacy.

Correlations between perceived support and self-confidence, self-efficacy, anxiety, anger, dejection, happiness and excitement at the three component levels are shown in Table 8. In accordance with Kenny (1994), multivariate analyses were not conducted at the target level as it was non-significant in the univariate analysis. At the relationship level of analysis, social support correlated significantly ($p < .05$) in a positive direction with excitement (.68, 95% CI: .60 to .76), happiness (.74, 95% CI: .67 to .81), self-efficacy (.64, 95% CI: .52 to .76) and self-confidence (.60, 95% CI: .45 to .74). There was also a negative correlation with anxiety (-.45, 95% CI: -.59 to -.31), dejection (-.45, 95% CI: -.63 to -.26), and anger (-.57, 95% CI: -.75 to -.40). At the perceiver level social support significantly correlated ($p < .05$) with self-efficacy (0.68, 95%

CI: 0.49 to 0.87), self-confidence (0.42, 95% CI: 0.14 to 0.65), excitement (0.46, 95% CI: 0.17 to 0.76) and happiness (0.69, 95% CI: 0.42 to 0.95) but not anxiety, dejection and anger.

Table 6. Variance components, 95% intervals, and Percentage of Variance accounted for by perceived support.

	Perceiver			Target			Relationship		
	VC	95% CI	% of variance	VC	95% CI	% of variance	VC	95% CI	% of variance
Support	.136	.05-.22	22*	.08	-.04-.20	13	.292	.23-.35	46*

Note. VC = variance components, CI = confidence intervals. * denoted $p < .05$.

Table 7. Variance components, 95% intervals, and Percentage of Variance accounted for by anxiety, dejection, anger, excitement, happiness, self-confidence and self-efficacy

	Perceiver			Target			Relationship		
	VC	95% CI	% of variance	VC	95% CI	% of variance	VC	95% CI	% of variance
Anxiety	.181	.07-.27	26*	.107	-.06-.01	16	.264	.20-.03	39*
Dejection	.123	.06-.18	47*	.004	-.00-.01	01	.091	.09-.09	35*
Anger	.163	.08-.25	39*	.008	-.01-.03	19	.125	.13-.13	30*
Excitement	.388	-.22-1.02	41*	.037	-.03-.14	04	.334	.34-.37	36*
Happiness	.399	.19-.58	41	.053	-.02-.10	05	.356	.25-.42	37*
Self-Confidence	.209	.10-.32	41*	.01	.01-.01	02*	.234	.17-.30	46*
Self-Efficacy	.236	.13-.34	49*	.019	.02-.02	04*	.146	.15-.15	31*

Note. VC = variance components, CI = confidence intervals, SC = Self-confidence, SE = Self-efficacy. * denoted $p < .05$.

Table 8. Multivariate Generalisability Correlations and Standard Errors at the Perceiver and Relational levels of Analysis

	Anxiety	Dejection	Anger	Excitement	Happiness	Self-s s	Self-Efficacy
	Confidence						
Perceiver	-.09 (.18)	.23 (.12)	.46* (.15)	.28 (.16)	.69* (.14)	.42* (.12)	.68* (.10)
Relationship	-.45* (.07)	.49* (.09)	.68* (.04)	.57* (.09)	.74* (.04)	.60* (.07)	.64* (.06)

Note. VC = variance components, CI = confidence intervals. * denoted $p < .05$.

Discussion

The current research includes two studies that aimed to examine athletes' perceptions of social support using generalisability theory. Both studies examined perceived support within the coach-athlete relationship and estimated correlations between perceived support and self-efficacy, self-confidence, anxiety, anger, dejection, excitement and happiness at the perceiver, target and relational levels of analysis. It was hypothesised that both studies would find that: (a) the relationship component would account for the highest amount of variance in athletes' perceived supportiveness of coaches, (b) positive emotions were likely to positively correlate with perceived social support at the relationship levels of analysis, (c) perceived social support would be positively associated with self-efficacy and self-confidence at the relationship level of analysis.

If the perceiver component was found to influence athletes' perceived support, then it could be assumed that specific athletes had rated all of the coaches as more or less supportive. If the target component was found to influence athletes' perceived support, then it could be assumed that all athletes had rated specific coaches as more or less supportive. If the relationship

component was found to influence an athletes' perceived support then it could be assumed that different athletes had rated different coaches as more or less supportive; that there would be systematic disagreement between athletes. The results from the current studies indicate that athletes perceived support was influenced significantly by the perceiver and relationship components, but not by the target component. The multivariate generalisability analyses revealed that perceived social support positively correlated with excitement, happiness, self-confidence and self-efficacy at the relationship and perceiver levels. The analysis showed that perceived social support was significantly negatively correlated with negative emotions including, anxiety, anger and dejection.

The univariate analyses demonstrated that the relational component accounted for 46% of the total variance in Study one, and 36% of the total variance in Study two, making the relational component the largest contributor to perceptions of coach supportiveness. These results mirror Rees et al. (2012) and previous studies from social psychology (Lakey et al., 1996; Lakey, Cohen & Neely, 2008; Lanz, 2007; Neely et al., 2006); they imply that there was disagreement amongst athletes over how supportive coaches were. This shows that Athlete A may view Coach A as more supportive than Coach B, whereas Athlete B may view Coach B as more supportive than Coach A.

The perceiver component was significant in both studies, accounting for 22% in Study one and 33 % in Study two of the total variance. Again, this is similar to other studies using generalisability analysis to examine perceived social support (Lakey, 2010; Rees et al., 2012). Despite the relational component accounting for the highest amount of total variance, the perceiver component is still important. It implies that stable, trait-like characteristics of athletes may play a significant role in how athletes judge the supportiveness of

their coaches. It demonstrates how some athletes have tendencies to rate all coaches as more or less supportive. For example Athlete A may have reported all of the coaches as being supportive, whereas Athlete B reported all of the coaches as less supportive.

The target component was found to be non-significant in both studies, accounting for just 13% in Study one and 14.5% in Study two of the total variance. This suggests that the characteristics of the coaches themselves had little influence on the athletes' perception of their supportiveness. In other words, there was little agreement between athletes regarding the most or least supportive coach. According to Lakey (2010), the sample size of the coaches in both studies ($N=5$) may be too small, limiting statistical power (Lakey, et al., 2004), and may be the reason for the small percentage of variance demonstrated. Despite being non-significant, the percentage of variance is slightly higher in the present research than in previous studies (Lakey et al., 1996; Giblin & Lakey, 2010; Veenstra et al., 2011) in social psychology. As Rees et al. (2012) noted coaching itself is a well-researched process, in which social norms have been distinguished regarding how coaches are supposed to be helpful. This may account for the increased levels of target support; these results mirror that of Rees et al. (2012).

In addition to investigating perceived support at the differing levels of analysis, the current research examined the relationship between perceived support and a range of outcome variables at the perceiver and relationship levels of analysis. Previous research has associated social support with self-confidence, self-efficacy and happiness (Veiel & Beaumann, 1992; Vealey, 2001; Rees & Freeman, 2007; Hays, Maynard, Thomas & Bawden, 2007; Rees & Freeman, 2009). However, research has not examined these links at the two

levels of analysis. Thus, developing on from the previous literature, the current studies showed that perceived social support positively correlated with excitement, happiness, self-confidence and self-efficacy at the relationship and perceiver levels. This suggests that when perceived support reflects the trait-like characteristics of the athletes, support is positively associated with these variables. When perceived support reflects the systematic disagreement between athletes, support is again positively associated with these variables. These results are consistent with Neely et al. (2006), who used generalisability analyses to examine the links between perceived social support and positive and negative affect.

At the relational level, negative emotions including anger, anxiety and dejection were negatively associated with support, unlike Neely et al. (2006) who found no correlations between perceived support and negative affect at the relational levels of analysis. Neely et al. (2006) explained this lack of correlation by suggesting that perhaps a longer relationship is needed than that used in their study, for example, they stated that low perceived support may be associated with negative affect when providers are unsupportive in a particularly significant circumstance, and possibly such circumstances did not occur in their study. They explained that it was also possible that perceived support has a closer affinity with positive affect than negative affect, as observed by Finch (1988). Athletes in the current studies had a mixed knowledge of the coaches: In Study one there were athletes who had followed the careers of the coaches and had a detailed knowledge of them, whereas others had not heard of the coaches before. In Study 2 some of the athletes had trained with the coaches before and most had heard of the coaches before. Perhaps it was this knowledge of the coaches, or existing relationship between them and the

athletes that enabled the current studies to observe the link between negative emotions and perceived support at the relational level. As Neely et al. (2006) explained, due to the relationship between the athletes and coaches in the present research, athletes may have witnessed critical situations in which coaches behaved in an unsupportive manner.

At the perceiver level of analysis Study 1 displayed a significant correlation in a negative direction between perceived support and dejection and anger. In study 2 there were no significant correlations between perceived support and negative emotions. This may be attributable to the real, naturalistic environment in which the Study 2 was conducted. It may be possible that in a real relationship other factors are present which are not present in an experimental setting, such as previous experiences with specific coaches and social influences from other athletes. Study 2 mirrors Neely et al. (2006) who also found no significant correlations between perceived support and negative affect, whereas Study 1 reflects Lakey and Scoboria (2005), who found that there were significant correlations between perceived support and both positive and negative affect when they asked participants to rate the supportiveness of their most important network members.

Previous studies aimed at increasing perceived support through interventions have been inconsistent with their findings. The present research goes some way to explaining these discrepancies. The current research shows that some coaches may be viewed as supportive by some athletes and yet the same coaches may be viewed as less supportive by other athletes. This suggests that in previous interventions when a support provider has been introduced to an athlete, the athlete may not have viewed him/her as supportive. The relationship effects shown in the current studies imply that

social support could be more effective if athletes are matched to a specific coach with whom they would share a supportive relationship. However, to do this, more research is required, exploring the notion of optimal matching between athletes and coaches, in which, athletes would be matched with a coach who would be perceived as highly supportive by the athlete. Multivariate generalisability analyses enable researchers to estimate correlations among relational effects within a sporting context, allowing the advancement of forecasting research. For example, Veenstra et al. (2011) found they were able to predict a recipient's relational support after just one brief conversation. They achieved this by showing support recipients a video of different providers before the recipients having multiple conversations with each of the support providers. They found that they were able to predict relational support from recipients' affective reactions to the perceived supportiveness of providers in response to single, ten minute conversations. The ability to repeat this in a sporting environment would mean that coaches and athletes could potentially be matched; ensuring that the athlete would perceive their coach to be highly supportive.

Although not as large as the relational component, the perceiver component had a significant amount of variance and should be considered when considering interventions. For example, interventions aimed at using social support to influence an outcome variable by introducing a new, supportive individual (Hogan, Linden & Najarian, 2002), may not be effective. Our results suggest that this may be because an athlete's support perception is partially influenced by their own personality and trait-like characteristics. Therefore, to increase perceived support, focus should be placed upon the characteristics of the athlete. By encouraging athletes to seek support and

convince them that it is acceptable to seek support (Hardy, Jones & Gould, 1996) their levels of perceived support may increase as they begin to seek and utilise support. Given that the target component was non-significant, it may be construed that to try to change a coach's characteristics would be superfluous.

Some potential limitations of the research should be noted. First, the sample size of the targets used in the current studies may be considered small; however, this reflects a true representation of a natural environment, as athletes are unlikely to be in contact with more than five coaches at any one time. Future research could, however, increase the sample size of coaches by perhaps using a larger training camp, or rating a larger number of famous coaches. However, this would be greatly time-consuming for participants and the validity of the data would be at risk as participants would quickly lose focus when rating the supportiveness of coaches. In addition, it would be extremely difficult to find a training camp in which multiple athletes train with a large number of coaches. Secondly, athletes were not asked to rate the supportiveness of providers they believed to be closest to them, or their most significant support providers. Athletes may not seek support from their coaches, but rather a team mate, friend or family member. Future research may consider examining other supportive relationships which an athlete may be a part of or asking them to rate their most significant support providers. This would, however, prevent researchers from examining each of the three influences, since the study design would produce a combined social influence consisting of provider and relational influences rather than perceiver, target and relationship influences. Thirdly, athletes who participated in the studies varied in how well they knew the coaches being rated. Some athletes had detailed knowledge of or had interacted with the coaches before, whereas others had not. This may

have influenced how they rated the coaches. Still, this provides an accurate representation of a true sporting environment in which athletes interact with different people to different extents. Future studies using hypothetical coaches could create fictional characters, preventing any of the athletes having had previous interactions or knowledge of the coaches. For example, vignettes could be used to create a fictional coach and describe his/her characteristics.

Despite these limitations, the current research provides a useful insight into perceived support within the coach-athlete relationship and also offers some direction for future research. In order to gain an understanding of how athletes develop their perceptions of support, researchers could explore an athlete's interactions with previous coaches, childhood experiences of coaches and sport. New, innovative methods of investigation are also required. For example, Uchino (2009) suggests the use of life-story interviewing, which could be used to examine previous coach-athlete interactions athletes may have experienced throughout their careers. Longitudinal studies would also enhance current knowledge. Veenstra et al. (2011) stated that relational influences were unstable overtime. Therefore, examining earlier experiences and interactions with coaches, and investigating how these have affected the athlete, may provide an insight into how relational influences change over time. The current research shows the potential that multivariate generalisability theory (Glaser et al., 1972; Brennan, 2001) has to offer to research within sport psychology.

In conclusion, the present research shows that the relationship between a coach and athlete affects how the athlete forms his/her judgement of a coach's supportiveness. This research illustrates how different outcome variables are correlated with perceived support at both the relational and

perceiver levels of analysis. The relational component proved to be the most influencing component in the both univariate and multivariate analyses.

Chapter 4: Study 4: A Qualitative exploration of the information used by athletes to judge the supportiveness of coaches.

Abstract

Perceived social support has been widely investigated within social and sport psychology; however, we are yet to fully understand how an athlete forms their perceptions of support. The purpose of the present research was to use qualitative research methods to deepen our understanding of the information used by athletes when judging the supportiveness of their coaches. In order to explore how perceived support judgements are formed, semi-structured interviews were conducted with ten martial artists who had recently taken part in a training camp in which they worked with multiple coaches.

According to Rees, Freeman, Bunney and Bell (2012) and Lakey (2010) perceived support judgements are influenced by perceiver, target and relationship components; inferring that the trait personality of the athlete, the objective characteristics of the coach and the interaction between the coach and athlete affect perceived support judgements. Interviews were structured using this information as a framework.

The findings from this study demonstrate that athletes weigh-up information differently when judging the supportiveness of coaches. It was clear that relational influences play a large part in how an athlete judges the supportiveness of their coach. This implies that social support judgements are not based on the quality and quantity of support as previously thought (Sarason et al., 1990).

The findings from this research deepen our current understanding of perceived support and provide information which has both theoretical and applied implications.

Introduction

There is a wealth of research demonstrating that increased levels of perceived support influences performance (Freeman, Rees & Hardy, 2009), self-efficacy (Rees & Freeman, 2009), self-confidence (Freeman & Rees, 2010), burn-out (DeFreese & Smith, 2012), and injury (Mitchell, Evans, Rees & Hardy, 2013). Despite the established importance of perceived support, the mechanisms underlying how perceived support judgements are formed remain unclear. Therefore, the current research aimed to explore how athletes judge the supportiveness of their coaches.

The coach-athlete relationship has received much interest; many researchers have examined and suggested models and programmes in order to achieve an optimal relationship (Mageau & Vallerand, 2003; Smith & Smoll, 2006; Jowett, 2009). Within coach-athlete relationship research coaches have been identified as a key support provider (Rhind & Jowett, 2010; LeVoi, 2007). The central role that coaches play in an athlete's support network provides the ideal arena in which to examine perceived support interactions. Previous studies (Rees, Freeman, Bell & Bunney, 2012) including studies two and three of this thesis have shown that perceived coach supportiveness is greatly influenced by the relational component. This implies that rather than one athlete viewing all coaches as supportive, or one coach being deemed as more supportive than another coach by all athletes, there is an interaction effect between the coach and the athlete that causes different athletes to view different coaches as more or less supportive. The current study aims to build on previous research by investigating the information used by athletes when forming judgements of coaches' supportiveness.

Theoretical models of perceived support have suggested a variety of determinants of support perceptions, including aspects of environmental, recipient and cognitive influences. Previous researchers have suggested that support perceptions were based upon the quality and quantity of the support they received (Sarason, Sarason & Pierce, 1990). However, more recent research has shown that enacted and perceived support share as little as 12% common variance (Haber, Cohen, Lucas & Baltes, 2007), thus implying that they are in fact two separate constructs (Dunkel-Schetter & Bennett, 1990; Helgeson, 1993; Wethington & Kessler, 1986). This evidence suggests that perceived support reflects more than just support recently received.

Previous research examining the perceived support of coaches has used generalisability theory (Brennan, 2001; Cronbach, Glessner, Nanda & Rajaratnam, 1972; Shavelson & webb, 1991) in order to examine perceived support at the perceiver, target and relational levels of analysis (Rees, Freeman, Bunney & Bell, 2012). These studies have found that the relational component, followed by the perceiver component, has the most influential effect on an individual's perceived supportiveness of a support provider (Rees et al., 2012; Lakey 2010). This implies that the interaction between an athlete and a coach will have the highest amount of influence over how supportive a coach is perceived to be by an athlete, followed by the athletes' personality influencing their perception. In addition, studies two and three of this thesis identified that perceived support is significantly related to outcome variables including self-confidence, self-efficacy and positive and negative emotions. Despite ascertaining this information, studies are yet to fully understand how athletes form their judgements of support.

Previous studies have suggested that perceived similarity and the personality of targets may also play a part in how support perceptions are formed (Neely et al., 2006; Lakey et al., 2004; Lakey et al., 2002; Sujor, Pillemar & Keaton, 1995). For example, Lakey et al. (2004) asked people to rate the same four videotaped targets on personality, similarity to perceivers and likely supportiveness. Using generalisability analyses (Brennan, 2001; Cronbach et al., 1972; Shavelson & webb, 1991) they determined that perceivers based their support judgements on perceived target similarity to perceivers at the relational and target levels of analysis. Perceivers also based support perceptions on the target personality at the relational and target level of analysis. They found that there was consensus amongst participants that more supportive targets were more neurotic, agreeable, introverted, conscientious and open to experience. The current research will enhance previous research by using athletes in a real life environment, rather than an experimentally manipulated environment. Furthermore, the current study investigated how athletes feel coaches' supportiveness influences specific outcome variables. By gaining an understanding of the information used by athletes to form their support judgements, we can further our understanding of how athletes weigh up information differently. Researchers may then be able to determine the role of perceived similarity and coach personality in the coach-athlete relationship.

The purpose of the present research was to use qualitative research methods to deepen our understanding of the information used by athletes when judging the supportiveness of their coaches. The study aimed to identify factors that underpin support perceptions at the three levels, focusing primarily on the relational influences. In order to explore how perceived support judgements are formed, semi-structured interviews were conducted with ten martial artists who

had recently taken part in a training camp in which they worked with multiple coaches.

The current research focused on the following research questions: (a) what information do athletes use to form their judgement of a coach's supportiveness? (b) How are performance-related outcome variables influenced by the supportiveness of the coach? The current research aimed to answer these questions and provide a deeper understanding of the mechanisms underlying how perceived support judgements are formed.

Method

Participants. Purposive sampling (King & Horrocks, 2010; Patton, 2002) was used to recruit ten Tae Kwon-do martial artists from Study 3 that would supply a deeper understanding of how athlete's judge the supportiveness of their coaches. Participants were identified by reviewing their previous responses to coach supportiveness on the Pass-Q (Freeman, Coffee & Rees, 2011). Ten individuals were chosen, one individual who had reported each coach to be the most supportive of the five coaches, and one individual who had reported each of the coaches to be the least supportive of the five coaches.

Participants consisted of six men and four women, ranging in age from 19 to 42 years. They had all been participating in Tae Kwon-do for a minimum of two years and six months and had attended a week long Tae Kwon-do training camp. Table 1. provides an overview of participant's demographic information. In order to keep participant and coach anonymity, athletes have been given pseudonyms and coaches are referred to as Coach A, B, C, D or E.

The coaches that were discussed in the interviews were all qualified coaches who had been teaching for a minimum of five years. Each coach had their own school of Tae Kwon-do outside of the training camp. The coaches have not been described individually in order to ensure their anonymity.

Table 10. Participants' demographic information.

Participant	Age (years)	Years Training	
Ben	38	13	Introduced to Tae Kwon-do when a group of friends decided to join the local club.
Sarah	33	13	Began training in Tae Kwon-do when her boyfriend and friends decided to start a new sport.
Lucy	21	11	Began Tae Kwon-do after watching a demonstration at a carnival.
Joe	23	13	Took up Tae Kwon-do because he was a big fan of Jackie Chan and wanted to do a marital art.
Rachel	18	9	Rachel began Tae Kwon-do after seeing some Tae Kwon-do competitors at a mixed martial arts competition. Began Tae Kwon-do when he was five years old with his father and brother. After taking a break for a few
Ryan	20	8	years, Ryan returned to Tae Kwon-do in order to reduce the amount of injuries he was sustaining through other sports.
Alan	39	18	Alan began Tae Kwon-do at his local leisure centre after being attacked.
Toby	25	11	Began training in Tae Kwon-do after years of training in other martial arts. Toby went to a lesson at his local leisure centre and found that he loved the energy of the lesson.
Jack	33	10	Jack and his friends decided to go to a Tae Kwon-do lesson and he fell in love with it.
Katy	42	6	Began training after her boyfriend introduced her to Tae Kwon-do.

Interview. Informal, semi-structured interviews were conducted using an interview guide to direct the conversation towards the focus of the study.

According to Sparkes and Smith (2014), semi-structured interviews allow participants to discuss and reaffirm the meanings that they attach to their own experiences, providing the researcher with a deeper understanding. Kvale (2007) has described this form of interviewing as ‘narrative interviewing’, in which the interviewer aims to draw out stories which can then be analysed. If conducted correctly, the stories told by each participant would reflect their social relationships, cultures and realities, providing intuitive insights into how athletes create their own world and about how these members live and interact within this world. Interviews were conducted using responsive interviewing techniques that aimed to create a relationship of trust between the interviewer and the participant. According to Rubin and Rubin (2012), a “friendly and gentle” (pp.36) tone is used, with a flexible pattern of questioning. Responsive interviewing requires reciprocity, thus, the interviewer shared personal thoughts, feelings and experiences with the participant, whilst making every effort not lead or suggest participant responses. According to Rubin and Rubin (2012) responsive interviewing describes a “helpful attitude for successfully doing interview” (Flick, 2014, p.208). The researcher behaved in an empathetic, understanding and respectful manner so as to create a comfortable and welcoming atmosphere for the participant. Semi-structured interviewing allowed the participant to divulge their experiences and opinions freely, and encouraged a relaxed and comfortable atmosphere. The use of semi-structured interviews enabled the researcher to use a mix of closed and open ended questions, allowing the use of their own judgement and pursuit of specific areas of interest (Arskey & Knight, 1999).

Interview guide. Alongside previous experiences, an extensive review of literature provided the foundation for the interview guide. A list of draft questions was created before being reviewed, refined and condensed by three researchers familiar with qualitative interviewing, resulting in irrelevant or inappropriate questions being discarded (Sparkes & Smith, 2014). A pilot interview was conducted with an additional tae kwon-do athlete who was not a part of the study, or the previous quantitative study using the interview guide in order to assess the flow and content of the guide (Sparkes & Smith, 2014).

The interview guide was designed to begin with neutral questions (Patton, 1990) such as 'Please would you tell me a bit about yourself, for example how did you get into Tae Kwon-do?' in order to create a foundation for the conversation. The next phase of the interview involved questions focused upon how supportive the participants viewed each of the five coaches, and what it was that caused them to be viewed as more or less supportive. Participants were encouraged to focus upon their relationships and experiences with the five training camp coaches; however, they were not discouraged from divulging experiences from other relationships and Tae Kwon-do scenarios. Consistent with previous research examining social support and outcome variables (Cowan, Slogrove & Hoelson, 2012; Freeman & Rees, 2010; Freeman & Rees, 2007), questions then focused upon how participants felt when working with each of the five coaches, particularly, their levels of anxiety, anger, dejection, happiness, enjoyment, self-efficacy and self-confidence. Based on previous research, closing questions were directed at how the participants formed their judgement of each coach's supportiveness (Lakey, 2010). Questions were grouped into similar themes in order to increase participant understanding and flow of conversation (Sparkes & Smith, 2014).

Probes were used in order to deepen and clarify the meaning of responses (Patton, 2002). As described by Sparkes and Smith (2014), three types of probing question were used: detail-orientated probes, aimed at developing the interviewers understanding of the experience the participant is describing; elaboration probes, aimed at encouraging the participant to reveal more to the interviewer; and finally clarification probes, aimed at seeking clarification.

The interview guide ensured that a consistent approach was utilised across all participants when interviewing, whilst allowing flexibility in the order of questioning, enhancing the natural flow of the conversation (Patton, 2002). Although the same interview questions were asked to each of the participants, the ordering of the questions was dependent on the response given by the participant. This approach was used to create a more open communication process with the participants (Patton, 2002).

Procedure. Having gained ethical approval for the study, ten participants were selected and contacted via e-mail or telephone. The purpose and requirements of the study were explained and discussed with the participants. Consequently, interviews were arranged between the lead researcher and each of the participants at a time and place of the participants choosing. Each interview was conducted individually, face to face and carried out by the lead researcher who had previous experience of qualitative interviewing and was familiar with the athletes, coaches and sport. These personal characteristics allowed for greater empathy with the participants and an ability to converse in the specific terminologies and idiosyncrasies associated with Tae kwon-do and social support. Upon meeting each of the participants and prior to obtaining informed consent from the participants, the objective and requirements of the

study were again described as a reminder to the participant. Participants were then asked to sign an informed consent form and to provide permission to audio record the interview. Participants were assured that their anonymity would be ensured at all times and were asked to provide contact details to which their interview transcript could be sent to facilitate transcript provision. At the end of each interview participants were thanked for their time and involvement and were given the opportunity to ask any questions and to provide any further information they deemed relevant. Each participant was interviewed once; interviews lasted from 48 minutes to 93 minutes and were recorded in their entirety. All interviews were transcribed verbatim and then verified by the respective participant to increase validity (Lincoln & Guba, 1985).

Data Analysis. Analysis began with the orthographic transcription of the interview recordings. Lapadat and Lindsay (1999) state that transcribing creates meaning; enabling the researcher to become familiar (Langridge, 2004) with the data and to begin organising and categorising themes and data. Whilst the interviews were taking place notes were made, as according to Maxwell (1996) ‘memos not only capture your analytic thinking about your data, they facilitate such thinking, stimulating analytic insights’ (pp.78). The transcripts were read through by the researcher several times in order to immerse themselves in the data and to gain a thorough understanding of the participants’ experiences from an empathetic position (Sparkes, 1998a).

Subsequently, thematic analysis (Braun & Clarke, 2006) was employed in order to explore common themes between the interviews. Braun and Clarke (2006) explained that ‘Thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex, account of data.’ (pp.78). Thematic analysis involves six phases: 1, Familiarising yourself

with the data, 2. Generating initial codes, 3. Searching for themes, 4. Reviewing themes, 5. Defining and naming themes and 6. Producing the report. This mirrors Aronson (1994) who stated that thematic analysis involved three stages: 1. Collecting the data, 2. Identifying all of the data that related to already classified patterns, and 3. Combining and cataloguing related patterns into sub-themes. Thematic analysis enables both commonalities and similarities between interviewees to be examined. In order to overcome the uniqueness of each individual's story and thus deprecate the value of imitable themes, the use of interview questions as themes was avoided. The three components (perceiver, target and relational), described by Lakey (2010) provided the deductive framework for the inductive thematic analysis of the transcripts.

Throughout the study regular discussions were held between all researchers in order to ensure that all quotes were checked against the general themes and that quotes were categorised correctly.

Results and Discussion

The aim of the current research was to explore the information used by athletes when judging the supportiveness of their coaches. The analysis of the interview transcripts revealed that each of the athletes had different opinions about the supportiveness of each of the coaches. During the thematic analysis of the interview transcripts several themes emerged. These themes are presented and discussed in a combined results and discussion section. Firstly, consideration is given to the three key influences of perceived support as described by Lakey (2010). Secondly, the antecedents of perceived support judgements are explored. Thirdly, the way in which perceived support relates to outcome variables was deliberated. Fourthly, behaviours described by the athletes are displayed and discussed.

Key Influences of support. Lakey (2010) identified three components as playing a part in an individual's perception of support. These included the perceiver, target and relational components. Lakey (2010) goes on to explain that within each of these components there are behavioural and cognitive mechanisms which effect how and why the component influences an individual's perception of support. The following section of the discussion provides evidence from the current study as to how behavioural and cognitive mechanisms influence the three components when athletes are judging the supportiveness of different coaches.

Perceiver Influences. Previous research examining perceiver influences on perceived support judgements has found it to be the second largest contributor (Lakey, 2010). In the present research, perceiver influences would show that one participant would view all of the coaches as more supportive than another participant. When asked who was the most and least supportive, all participants provided different responses. However, Katy stated "they're all supportive and they're all there to help you and if you can't do something they will tell you what you need to do to fix it." This demonstrates that Katy may possess an innate disposition to view the coaches as more supportive than the other participants.

Given the prominence of the perceiver influence in previous research, it was surprising that the only evidence of the perceiver influence in this study was the above quote. The lack of perceiver influence was unexpected due to the significance level of the perceiver component in study three.

One possible explanation for the lack of perceiver influences was described by Joe:

"I think the coaches we've got there is quite a nice mix of experienced coaches, I think it would be interesting to look at some other instructors within Tae Kwon-do that aren't... as experienced or... ...experience has a big part but then I know fifth dans, who you might know, who are absolute [idiots], for lack of a better word. Who are very arrogant, and they might have some good knowledge and stuff but the way they come across themselves and that, and the athlete end's up horrendous. And you know you won't want to train with them and you won't have a good training session... because of how their teaching is, you won't have a good session just because of that, you're relationship with that coach. So what would be a good idea might be to look at other, a broader range of instructors. Different grades, stuff like that."

This quote suggests that perhaps these coaches were chosen to instruct at the summer camp because they had the ability to adapt their behaviours for different athletes. As Joe expressed, a more diverse group of coaches with a more varying wealth of experience may have provided very different results. Study 3 however, used the same sample of coaches and found that the perceiver influence was the second largest contributor to the variance in perceived supportiveness of the coaches, thus suggesting that the ten participants in this study may not provide an accurate representation of the martial arts camp.

Another explanation for the lack of perceiver influences is that the sample of participants used in this study was chosen based upon their ratings of the coaches. The sample was selected in order to explore the way in which athletes differ in the way in which they judge the supportiveness of coaches.

Thus, individuals influenced more strongly by the perceiver component may not have been included in the present research.

Behavioural Mechanisms. Lakey (2010) stated that certain individuals elicit more supportive acts than other athletes; this has been examined by Neely et al. (2006) who found no such occurrence. However, Neely et al. (2006) stated that this was due to the study's small sample size, and that had a larger population been used they would expect to find this result. If individuals were found to induce more supportive acts, this may result in an increase in the perceived supportiveness of a coach. A common theme between the participants was that perceived supportiveness was greatly influenced by how well an athlete knew the coach or how well they got on with him/her. This may imply that because the coaches had an understanding of the athletes, they were able to determine the appropriate type of support to provide, and thus, were perceived as highly supportive. Previous research (Rees & Hardy, 2000) has shown that there are different types of support: emotional, tangible, esteem and informational, and that different athletes require different types of support. The athletes have stated that they received different types of support from the coaches. Perhaps some coaches were able to better select which form of support to provide and thus appeared more supportive to the participant. For example, Joe explained how Coach C had provided tangible support by providing training areas for the athlete and helping him out financially. Joe stated “[Coach C] will go well out of their way and spend time and money on hall space and doing events and stuff for the whole team... yeah [Coach C] is very supportive of me doing competitions, if I’m the only one from the club doing it, [Coach C] will make sure everyone knows I’ve gone and done it”. None of the other participants mentioned this particular coach having personally helped

them with this form of support. This may also be interpreted as a relational influence, as this may be something that only occurs between Joe and Coach C. However, other participants did describe Coach C as performing other supportive acts, such as moral support and encouragement during fitness training. Ben stated “[Coach C’s] always pushing you on, giving you that little bit extra.”

Cognitive Mechanisms. Perceivers do not see targets in the same way, even when they have identical information about the targets (Kenny, 1994). Individuals utilise different concepts to think about targets, thus, opinions athletes form about the coaches vary. For example, some participants explained that they favoured Coach A’s sense of humour, whereas others felt that Coach A’s humour could be taken offensively. Sarah stated “I think sometimes [Coach A] can be a little... can say things... in a way that is meant to be joking but could be perceived or could be taken as critical and not taken in good humour.” Katy explained “sometimes I think people don’t realise that [Coach A] is being humorous and they feel quite insulted.” Jack said “nobody can quite do humour as well as [Coach A].” and Alan said

“...with [Coach A], it’s more positive energy, and jokes and stuff like that.

The stuff [Coach A] comes out with sometimes.. very very very funny, it kind of, it keeps you going, [Coach A’s] very positive, fun, can be very fun, they don’t look like they would be, when you see [Coach A] you think oh blimey, [Coach A] has got a very good sense of humour, you’ll find it and when they come out with stuff so... it’s very good, I think it’s funny anyway.”

These quotes show that there is much variation in the way in which athletes use the information about coaches in different ways to inform their perception of them.

Target Influences. Whilst analysing the transcripts it became apparent that there was some agreement between participants over which coach was perceived as the least supportive. Coach E was identified by multiple athletes as being the least supportive of the five coaches. However, only one participant demonstrated that they felt strongly about this. Rachel described the unsupportive behaviours which she felt Coach E exhibited towards her and other athletes. “Coach E’s just not very welcoming, his body language, just stood there a bit like this (folds her arms), and a bit you know, he doesn’t look very involved, like when he’s teaching you.”

Other participants identified Coach E as being the least supportive, although, they provided differing reasons. For example, Alan stated “... I have the least contact with I suppose, Coach E, um..... I suppose he would be the least supportive because he’s so far away and I don’t like, really know where he teaches or how to get hold of him.” The target influence refers to a support provider’s objective characteristics; the quotes above demonstrate how objective characteristics of Coach E have informed athletes’ perceptions of his supportiveness. Previous research has shown that the target component is responsible for the least amount of variance in perceived support (Rees et al, 2012; Lakey, 2010). However, within sport psychology research the target effect has been shown to be higher than in social psychology (Rees et al., 2012). This has been explained by the explicit guidelines and information regarding coaching strategies (Jowett & Poczwardowski 2007). Coaches are provided

with advice on how to be supportive towards their athletes, whereas, support providers in mainstream psychology are not given guidance.

Perhaps, unsupportive behaviours should be observed more closely. It is possible that there are specific acts or behaviours that Coach E did which presented them in a less supportive way. It may be beneficial to explore unsupportive actions in more detail so as to provide information and education to coaches.

Relational Influences. Throughout the analysis of the interview transcripts it became clear that there were differences in how athletes perceived the behaviours and characteristics of the coaches. The interviews demonstrated that different athletes identified different coaches as being more or less supportive. For example, Sarah stated that Coach A was the most supportive coach. “I find [Coach A] more supportive naturally. If I was in a competing situation and [Coach A] and [Coach E] walked past, I know that [Coach A] would stop and cheer and [Coach E]... maybe... might not.” When describing Coach D, Ben stated “Coach D is incredibly supportive”. Katy expressed that Coach C was the most supportive, “it’s probably [Coach C], but I don’t know if that’s because I know [Coach C], so there’s no barriers, or you don’t worry about pestering, you know, sometimes you worry don’t you, because they’re such high grades and they know all this stuff and you worry about pestering them. Um so [Coach C] is the first name that pops into my head, probably because, I-I don’t have that barrier, because... because [Coach C’s] just [Coach C].”

When asked who was the least supportive, again there were mixed responses. For example, Joe said “I’d say [Coach B], but that’s closely followed by [Coach E]. But that’s only because I rarely get the chance to train with

[Coach E]." Whereas Ryan stated "least supportive... would probably be [Coach A] I reckon..... just because... [Coach A] is so much more sparring orientated, and the physicality of it makes [coach A] less... inclined... less soft, if that makes sense...?" Jack said "[Coach A] is the best and the worst and I really think that. I think that [Coach A] is passionately awesome, um I think [Coach A] has got a lot of issues, personal issues, um but I think [coach A] is an amazing instructor so... least supportive, most supportive, [Coach A] could be either depending on how I felt at the time." "[Coach A] could rub your face in the dirt but [Coach A] could also have the ability to be the most supportive one." These examples show the wide range of discrepancies in which Coach A was perceived as the most and least supportive. This data suggests that either athletes use different information when judging the supportiveness of their coach, or that they weigh up information differently, placing more meaning on different behaviours or characteristics of the coach when judging the supportiveness of their coach.

Behavioural Mechanisms. When asked about the supportiveness of each of the coaches, athletes were able to provide descriptive examples of the types of behaviours and characteristics that caused them to perceive the coach as supportive. One characteristic that multiple athletes described was coaches demonstrating that they were interested and invested in the athlete; coaches showing that they were prepared to give their time and knowledge to the athlete in a selfless manner. For example, Joe stated "yeah I think she's pretty supportive as an instructor in her way of trying to help you to improve. And she doesn't so much praise you... constructively criticise what you do, I would say... so she's quite supportive, I would say. "This quote would suggest that Joe perceives a coach as supportive when they show that they want to help him

improve his abilities and techniques. Potentially investing time and effort rather than providing encouragement.

Similar to Joe's statement, Toby also described how Coach A would invest time and effort into his techniques, helping him to improve. ... she's always been the person that on, like black belt training she'll say to me oh adjust your stance or do this but ignore the people around me, and at first I thought oh am I really that bad, and then you realise oh no I'm one of the one's she wants to nurture through." These statements imply that coaches need to exhibit behaviours of investment in order for an athlete to view them as supportive.

Jack went on to explain that supportive coaches will exert additional support that is not necessarily expected. For example when describing Coach B's supportive characteristics Jack said "he'll go out of his way to help you, so we've just done a demonstration in [place], which has got absolutely no benefit to him and he sent his team up to us and did a demonstration with us, just because that's what he does. No benefit to himself, so I think that kind of thing's great yeah, definitely."

"He makes the effort with no gain to himself, um..... I don't think that he's full of ego or anything like that, like he barks like a sergeant major but he's not... I never feel like he's showing off" (Jack).

It is evident that athletes want to feel that their coaches are willing to give them their time and expertise, but that in order to be perceived as more supportive than other coaches they have to display a selfless investment in the athlete.

Cognitive Mechanisms. Lakey (2010) explained that differences in opinions regarding the supportiveness of providers may be due to recipients

differing in how they weigh information about support providers when forming a judgement. Lakey (2010) provides the example; Perceiver A may weigh a support providers agreeableness and conscientiousness heavily when judging the supportiveness of a provider. Whereas, Perceiver B, may weigh emotional stability and openness heavily when judging a providers supportiveness; if so, both Perceivers A and B may view the providers' personality characteristics in the same way, however, they will construct different judgements of the supportiveness of the provider because of how perceivers combine information about providers personality characteristics.

Throughout the interviews, participants provided examples of the information they used to judge the supportiveness of the coaches. Ryan, for example, stated “the most supportive... would probably be [Coach E] I reckon... um... just because I think [Coach E] pays slightly more attention to you. And as much as [Coach D] would be very supportive as well, the fact that it takes so long to get through whatever they’re saying would irritate me slightly... so I would lose patience.” Katy expressed that

“it depends what you want from that supportiveness, if you want somebody to say there’s a big flashing bull [removal of word] sign over your head, get back on the floor, then obviously [Coach A] is the one to go to, and I’m not saying that the others don’t do that, but maybe it’s just easier to go to [Coach A]. And if the support you want is to say there there you don’t have to do it anymore, then maybe you would pick someone who comes across a bit softer, and you would think oh that’s more supportive, but in actual fact in terms of your training the person who says you’re fine, get back in the dojang, is the one that’s going to progress you and that is supportive.” These two quotes demonstrate how

one athlete feels that supportive coach will give them a lot of attention,

Ben said

"I think [Coach A's] just quite... good, at bringing the best out of you in their training sessions and stuff like that, [Coach A's] quite funny, um and [Coach A] does it in a way that appeals to me cause I quite like a bit of humour... so I think that's how they, yeah I think [Coach A] supports you by making you feel alright about everything. But at the same token [Coach A] will also take the mick out of you which, you know, it works I think."

These quotes demonstrate how different information is used and how it is weighed differently by perceivers. These quotes support previous research stating that athletes weigh information differently when judging the supportiveness of coaches.

Antecedents of perceived support. Personality. The analysis of the transcripts revealed that athletes utilised information regarding coaches' personalities when judging coach supportiveness. Lutz and Lakey's (2001) study examining individual differences in how people make support judgements found that there were significant differences in the extent to which participants used different target personality traits to judge supportiveness. The findings from the current study mirror Lutz and Lakey's (2001) study in that the athletes used the personalities of the coaches to influence their judgement of the coach's supportiveness. When asked about what the coaches did that was supportive, the athletes often used the coaches' personality characteristics to describe their supportiveness. Ben stated "if they're conscientious, someone like Coach D, the fact that you know that what they're teaching you is right, so you're confident in yourself, which is support because you know, you know that

it's right. So I say that that definitely plays a part in it." Joe said "I find Coach C and Coach E are very open and outgoing, whereas Coach A and Coach D are a lot more reserved, so you, you get much less of a feeling of interaction than you do with some other instructors." Other participants discussed how they thought that a coach's personality was an important factor that was involved in how they judge the supportiveness of their coaches. For example, Lucy said "if they're more friendly then you feel like, I think them being more friendly makes you feel like they're being more supportive..." Friendliness has been described as inequalities encapsulated by agreeableness in the Big Five trait model.

According to Lakey et al. (2004), perceived target similarity to perceivers plays a part in how individuals perceive the supportiveness of providers. Athletes in the present research displayed how they like specific characteristics of the coaches and felt that certain characteristics made them appear more supportive. According to Scarr and McCartney (1983), our own personality traits induce reactions from others which are consistent with our own personalities. Thus, it may be inferred that providers who are perceived to be similar may in fact be viewed as supportive also.

The Big five personality traits include extroversion, openness, agreeableness, conscientiousness and neuroticism. Swickert, Hittner and Foster (2010) found that extraversion was positively related to perceived support; implying that coaches who were perceived by athletes as being extrovert were likely to be perceived as supportive. Rachel stated that Coach A was the most supportive coach of all the coaches; Rachel stated "I think Coach A is very enthusiastic about teaching". Enthusiasm is one of the key constructs of extroversion (McCrae & John, 1992). The Big five personality traits have been previously given a variety of names, including agreeableness being

labelled as friendliness by Guilford and Zimmerman (1949). Lucy explained that she felt friendliness was important when judging the supportiveness of coaches. “I think them being more friendly makes you feel like they’re being more supportive...” Highly supportive providers have been perceived as highly agreeable (Lakey et al., 1999; Lakey et al., 2004). This would suggest that coaches who are highly agreeable are perceived as highly supportive.

Familiarity (Previous experience). Many of the athletes described knowing a particular coach better or being more familiar with them as a reason for perceiving that coach to be more supportive.

When asked who was the most supportive coach, Lucy expressed “I think I say Coach C, because I know him better than the others...” Sarah stated that she thought that Coach A was more supportive “because I’m a lot more familiar with Coach A”

Participants appeared to base their opinion of how well they knew the coach on previous experiences with each of the coaches. When asked about how they formed their opinions of each coach’s supportiveness, participants explained that they thought back to the experiences they had when working with each of the coaches. “.... I just literally imagine being at summer camp and them teaching me...just what I felt at the time, and um.... their sort of demeanour around you...” (Lucy). “I try to think back on my past experiences, and how I felt when they were teaching me.” (Ryan). Athletes were able to recall situations in which particular coaches performed supportive acts; the information regarding previous experiences in which supportive acts had occurred were used as evidence that a particular coach would be supportive and the athlete believed that they would continue to be supportive in the future. For example, Ben stated “Coach D is the most supportive because it’s tried and tested!” and “It’s a

proven fact... for me that he is more supportive because I train with him ... week in, week out". Sarah explained that when judging the supportiveness of the coaches she would use previous experiences to hypothesise how the coaches would react to her. "I think about how supportive they would be in a competition situation... whether they would be cheering me, um... whether they would be constructive with their criticism and things. I think about what they are like at summer camp and whether they are supporting your training um and um... and also are sympathetic to um... what you go through when you are in situations like that as well." This provides evidence that behavioural mechanisms play a part in the judgement of perceived supportiveness of coaches.

Competency. Athletes expressed that they felt coaches were supportive if they displayed that they were competent. Sarah said "what [Coach A's] got is the experience thing again, I know she's got a lot of experience, and I know Coach E has but probably in a different area or one I'm not familiar with". This implies that athletes need to have confidence in their coaches knowledge and ability.

Outcome variables. During the interview participants were asked about how they thought they would feel if they were to work with the coaches again. Studies 2 and 3 showed that perceived support positively correlated with positive emotions, self-confidence and self-efficacy at the relational level of analysis. Participants in the current study explained that the supportiveness of the coaches heavily influenced the way in which they felt when working with the coaches. For example, Ben stated "it makes you feel good that you've got somebody as supportive as Coach D", and Toby said " I think that starts you off on a good foot, so when you go in you think they're supportive, they fill you with confidence, and you start off feeling happy, which energises you, which um

builds your own confidence in what you're doing is correct. Whereas if you go in somewhere, and say you think oh I don't really want to work hard for them, I'm not bothered if they correct me or not because I don't think they're going to tell me the right thing".

It became apparent that each of the athletes experienced different emotions when working with the different coaches, for example, Toby stated that "I can't imagine feeling dejected by him" whereas when asked how she would feel about working with Coach E again Rachel stated "not thrilled, I have to say I probably wouldn't look forward to it" and "it sometimes feels... like a bit of a punishment, like why am I having to do this [work with Coach E] again...". The common theme between them was that each of the participants stated that they felt positive and more confident when working with the coach that they felt was the most supportive. This supports previous literature linking social support with self-confidence, self-efficacy and happiness (Veiel & Beaumann, 1992; Rees & Freeman, 2007; Hays, Maynard & Thomas, 2007; Rees & Freeman, 2009). Further research may wish to examine more closely the mechanisms underlying the link between perceived support and outcome variables.

Supportive behaviours. During the interviews the athletes described various behaviours and actions that the different coaches did which made them appear to be supportive. Previous research has described and made suggestions regarding what supportive actions consist of. Rees and Hardy (2000) interviewed ten high-level athletes and were able to identify four dimensions of support: emotional, esteem, informational and tangible. These dimensions describe some of the ways in which coaches can be supportive towards their athletes; these previous findings mirror the behaviours described

by athletes in the current study. For example, when discussing coach A Jack stated

"I've always found [Coach A] very, very willing to give an opinion as to what, what you personally need to do. Whereas some of the instructors don't give back personal things, I find [Coach A] is very likely to come up and give you individual hints or pieces of advice..."

This quote shows that Jack viewed technical advice as a supportive behaviour. There seemed to be some agreement about informational support being a beneficial dimension of support as other athletes also described this form of support. Ben stated the following when discussing coach D.

"he is incredibly supportive, um.... in, at any time... um...you know, even bless him, when I've missed quite a while of tkd like I have now, I know I can go back in... and although I would've forgotten all of my patterns and everything else not a problem, he'll be there and he'll re-teach me every pattern he's taught me 10 times before."

Information support has been defined as "providing the individual with advice or guidance concerning possible solutions to a problem" (Cutrona & Russell, 1990p.322), which can be identified in the above quotes.

Sarah explained that Coach A provided her with esteem support:

"I think at competitions and stuff she will um make an effort to support you and shout for you and be really supportive. And she's very good at identifying when you are maybe lagging a bit and need a bit of encouragement"

In addition Sarah depicted that Coach A is good at "positively encouraging everyone so that everyone is sparring to the best that of their ability".

Sarah described Coach B's supportive behaviours by saying the following:

“[Coach B] makes you feel very comfortable, he appreciated the pain that you go through um, and you can, and he’s trained at summer camp many times when we’ve been training so we know he’s been through the same thing so yeah he does give moral support I think. He’s been there, done it and uses that to his advantage when he’s in a coaching situation.”

The above quote displays the emotional support dimension. Cutrona & Russell (1990) define emotional support as “the ability to turn to others for comfort and security during times of stress, leading the person to feel that he or she is cared for by others” (p.322). The above quote suggests that Sarah feels that Coach C has the ability to relate to her and provide emotional support.

Tangible support has been defined as “concrete instrumental assistance, in which a person in a stressful situation is given the necessary resources (e.g., financial assistance, physical help with tasks) to cope with the stressful event” (Cutrona & Russell, 1990, p.322). “Joe described an example of tangible support provided to him by Coach C in the past.

“he’ll go well out of his way and spend time, and money on hall space and doing events and stuff for the whole team... yeah he’s very supportive of me doing competitions, if I’m the only one from the club doing it, he’ll make sure everyone knows I’ve gone and done it and.... um... a good way of getting more feedback as well is that at the end of the year he does like black belt of the year, competitor of the year and all that stuff, which is good, so yeah”

Cutrona and Russell (1990) define esteem support as “the bolstering of a person’s sense of competence or self-esteem by other people. Giving an individual positive feedback on his or her skills and abilities or

expressing a belief that the person is capable of coping with a stressful event are example of this type of support" (p.322).

The above quotes provide some examples of the types of behaviours that were perceived to be supportive by the athletes in the present study. However, it is important to keep in mind that the information each individual athlete uses when judging support will vary between athletes. Therefore, despite there being some level of agreement between the athletes over some generic supportive behaviours, high levels of perceived support cannot be guaranteed by using these behaviours. Although, this information does provide athletes with an insight into how athletes judge the supportiveness of coaches.

Unsupportive behaviours. Lucy expressed that although she feels Coach C is supportive he can also demonstrate behaviours which she sometimes interprets as unsupportive. Lucy told the interviewer that "[Coach C] is supportive but he... he also, he tries to make you work harder by saying things like oh are you going to bend your arms on those press-ups, when you're trying as hard as you can. But, I I think in a way, in one way he's supportive but in another way it it almost feels like you can't do anything right." In addition to this Lucy said "if you're doing power techniques against the pad or something, he'll come over and watch and you're like hitting it as hard as you can he'll be like oh are you going to start hitting that pad... and that sort of thing. And actually he's only joking and trying to encouraging you and that sort of thing but... he's got, sort of got a bit of a negative way of doing it..."

When asked about coach B Lucy explained that she liked his humour but that it can be unsupportive if you are the focus of his humour. "Well he's quite loud as well so you know he would give you encouragement and stuff, but he also has got a bit of a sense of humour on him so... he also might take the mick out of

you..." Lucy furthered this by explaining that her opinions about Coach B are influenced by seeing Coach B outside of training. This is common with each of the coaches as due to the nature of the camp there is 'down-time' in which athletes and coaches move about the camp freely and can engage in other activities and conversation. "because in training I might say that he's unsupportive because you see him outside of training and he's really nice, but it's it's hard to um it's hard to say, but um... I think... if it was just training then I would say possible unsupportive."

It is also clear that certain characteristics of the coaches are recognised by all of the athletes. How the athletes perceive these characteristics or weigh them up varies, but they have all identified specific themes regarding coach characteristics. For instance, Coach C has been described as having 'drill-sergeant' qualities by the participants. Coach has been described as investing in those that work hard, or liking athletes that work hard.

Limitations. Some potential limitations of the study should be noted. Firstly, the current research involved the use of retrospective interviews. However, all of the participants had trained with each of the coaches since the initial training week, and thus were able to share additional experiences during the interviews. Future researchers may wish to consider using stimulated recall interviews involving the use of audio recordings, video footage, scrapbooks, photographs and other items to help participants remember their experiences (Sparkes & Smith, 2014).

It should be observed that semi-structured interviews have their own limitations. For example, there can be barriers between the interviewer and participants, implying that participants may not always share their experiences fully. Another weakness of semi-structured interviewing is that it limits analysis

options. Given that the interview is primarily structured by the interviewer, structured analysis cannot be conducted. This leads to the potential loss of some of the complexities of people's lives (Sparkes & Smith, 2014). Another limitation of interviewing is that concerns exist around 'leading questions' (Kvale & Brinkman, 2009); suggesting that the results are determined by the questions asked. In order to overcome this limitation, the current study took great care in the wording and phrasing of questions.

In addition, consideration should be given to the transcription of the interviews; Kvale and Brinkman (2009) identified that the quality of transcription is rarely assessed within qualitative research. They discussed how body language, posture, gestures, tone of voice, intonations, and breathing are lost. They stated that transcripts are "impoverished, decontextualized renderings of live interview conversations" (Kvale & Brinkman, 2009. pp. 178). King and Horrocks (2010) stated that there are three main threats to the quality of transcription: recording quality, missing context and 'cleaning up' transcribed talk. To overcome the difficulties of transcription, future researchers should make every effort to improve recording quality by asking questions very clearly and at a steady or measured pace. Researchers should use a form of coding or description to demonstrate paralinguistic features and they should pay particular attention to ensuring that any missing or inaudible words or phrases are not predicted or rephrased to make the data appear more coherent.

A further limitation of the study is that tae kwon-do is an individual sport, thus, findings may be limited to similar, individual sports. Future research may consider examining similar relationships and experiences within team sports to increase the generalisability of the findings.

Finally, the method of sampling used may be perceived as a limitation as the population of participants who took part in the study were specifically selected and thus, may not provide an accurate representation of the perceiver influence. The sample was determined based on the coach that each participant had stated as being the most and least supportive. This method of selection placed more emphasis on participants who differed in their judgements of coach supportiveness. Future research may wish to use a random sampling method in which to examine perceiver, target and relational influences.

Conclusion

The findings from this study demonstrate that athletes weigh information differently when judging the supportiveness of coaches, mirroring previous research (Rees et al., 2012; Lakey 2010). In keeping with Lakey (2010), the current research suggests that relational influences play a large role in how athletes perceive coach supportiveness. The athletes in the current study have demonstrated that perceived similarity, coach personality and previous experiences all factor in to the judgement of support. The findings from this study provide a deeper understanding of how perceived support judgements are formed and provide evidence suggesting that athletes weigh information differently when forming judgements of coach supportiveness. These findings have both theoretical and applied implications. They suggest that rather than support perceptions being based on the quality and quantity of support received as suggested by Sarason et al., (1990), perceived support is largely influenced by the relationship between the athlete and a coach. Thus, an intervention aimed at increasing perceived support by introducing a new support provider may not be effective. Attention should be given to the specific relationship between the coach and the athlete. Future research may consider the concept

of 'optimal matching' (Veenstra et al., 2011), the notion of matching a support provider with a perceiver in order to create an unusually supportive relationship.

Future research may wish to consider measuring participants' levels of perceived support in addition to exploring perceptions of the coach's supportiveness. Kenny (1994) stated that perceivers do not see targets in the same way, despite having the same information about the targets. This suggests that those participants who have innate low levels of perceived support may view coaches differently to individuals who have high levels of perceived support (Lakey & Drew, 1997). Future research should consider individuals' levels of perceived support as they may influence research findings.

The current research provides insight into athletes' perceived supportiveness of their coaches and of the association between perceived support and outcome variables. Future research should continue to develop this understanding by investigating the use of optimal matching and further examining the relationship between perceived support and outcome variables.

Chapter 5: General Discussion

This thesis consisted of four studies that examined social support; the first examined enacted and perceived support, the remaining three focused solely on perceived support. Study one investigated the mechanisms underlying the effect of social support upon performance during a working memory task. The following three studies explored the information used by athletes to form a judgement of a coach's supportiveness and how perceived support influences performance related outcome variables at different levels of analysis. All four studies built upon previous knowledge of social support.

Study one showed that support did not improve performance, but that it did reduce activations in an area of the brain associated with the stress response. Participants in the support group showed reduced activity in the ACC when compared with the non-support group. The ACC has previously been implicated in the physiological response to stress (Etkin, Egner & Kalisch, 2011), however, there are many other areas of the brain that have been suggested to be involved in the stress response (Kellogg, 2012). These other areas, such as the hypothalamic-pituitary-adrenocortical axis did not show any activations. This suggests that perhaps the activation in the ACC may have been associated with another emotion or function, such as cognitive processing or attention (Garrett, 2015). The manipulation check conducted within study one demonstrated that although individuals were given identical information within their groups, there were differences in how they rated the support available to them and provided to them by the researcher. This implies that individuals judge support in different ways, or use different information when forming their judgement of support. Studies two and three developed the findings from study one by investigating how individuals developed their perceptions of support.

Studies two and three demonstrated that the relationship between a coach and an athlete has the largest influence on an athlete's perceived support. Performance-related outcome variables were also examined, and it was found that perceived support significantly correlated with these variables at the relational and perceiver levels of analysis.

Study four developed upon study three by further investigating the information used by athletes to judge the supportiveness of their coaches. Study four explored how athletes form their perceptions of support, focusing on the information that they use and what behaviours or characteristics a coach exhibits in order to be perceived as more or less supportive than another coach.

Study four adopted a qualitative approach and consisted of interviewing ten participants from Study three about the supportiveness of the coaches that they worked with during the training camp. The interviews were focused around which coaches were more or less supportive to the athletes and why they viewed them in this way. Performance-related outcome variables were also discussed with the athletes. In addition, questions were asked regarding the information they believed they used in order to judge coaches supportiveness. Based upon Lakey (2010), focus was placed upon perceived similarity and personalities of the coaches and athletes. It became apparent that athletes primarily used previous experiences to base their support judgements on. Athletes reported that they would think back to a situation or scenario in which they had worked with each coach and judge their supportiveness based on that interaction.

Collectively these four studies have added to the current knowledge and understanding of social support. Each of these studies has demonstrated that

individuals view support providers in different ways; this has both theoretical and applied implications, which will now be discussed.

Theoretical Implications

The final three studies displayed the role that the interaction between an athlete and a coach has on athlete perceived supportiveness. Current research investigating social support will need to give extensive consideration to the support provider that they choose, as this will have a significant influence over the perceived levels of support of the participants and may dramatically influence any results. Researchers will need to reflect on the different ways in which athletes weigh up information regarding the supportiveness of support providers as this may influence the outcome of their study.

Previous research states that social support plays a role in the stress response either by buffering the effects of stress or by influencing the initial stress appraisal (Rees & Freeman, 2009; Cohen & Wills, 1985). Study one implies that social support may have a role in reducing the activity of the cingulate gyrus, an area previously associated with the initial stress response and emotional control (Eisenberger et al., 2007). This implies that social support may have a part in reducing the negative effects of stress by moderating the initial stress response. However, the evidence provided by this study is insufficient as the cingulate gyrus has also been implicated in other tasks such as attentional control (Kellogg, 2012). Additional areas associated with the stress response would need to have been activated in order to effectively examine the effect of support on stress. Previous studies have associated social support with increases in performance (Schreurs, Hetty van Emmerik, Guenter, & Germeyns, 2012); Study one did not support this. There were no significant differences in performance between the support and non-support

groups. However, not all of the participants in the support group reported that they had been given support. This may suggest that the support provider was not perceived as supportive due to other factors. For example, studies two, three and four showed that the relationship between a perceiver and support provider significantly influenced the perceived level of support.

Previous literature has extensively shown that high levels of support are beneficial to sports performance (Freeman et al., 2009). However, this thesis shows that support is not universally effective. For example, increasing the amount of support given to an athlete will not necessarily increase an athlete's levels of perceived support. Contrary to this, participants in Study Four described how coaches provided them with more support, and exhibit more supportive behaviours towards them which led them to perceiving those coaches as more supportive.

Study one showed that participants did not perceive an experimentally manipulated support intervention in the same way. Despite each of the participants being given the same support manipulation, only some of them expressed perceiving support, when answering the manipulation check. The results of studies two and three provided an explanation for this unexpected result. In keeping with previous research in social and sport psychology (Rees et al., 2012; Lakey 2010), this thesis found that an athletes perceived support is highly influenced by the relational component. Neely et al. (2006) conducted a study investigating the extent to which the link between perceived support and affect reflected recipients levels of trait perceived support. In addition to this, they examined three distinct social processes: the objective supportiveness of providers, the unique relationships among recipients and providers that were stable over occasions, and the unique relationships that varies across

occasions. The study involved ten recipients interacting with each of the same four support providers on five separate occasions for a total of 200 interactions. Recipients and independent observers rated recipient affect and provider support. One of their findings demonstrated that participants and observers did not rate corresponding levels of support from the providers. This suggests that recipients did not identify the same supportive acts as the observers, mirroring our findings in demonstrating that individuals must use different information when perceiving support. This systematic disagreement between individuals regarding perceived supportiveness of providers has become known as relational influences or the relational component.

Lakey (2010) identified and defined three influences of an individual's perceived support: perceiver, provider and relational components. The relational component was shown to be the most influential component in an individual's perceived support (Rees et al., 2012; Lakey 2010). Studies two, three and four support previous research, they demonstrated that the relational component followed by the perceiver component had the most influential effect upon athletes perceived supportiveness of coaches. These findings mirror previous research (Rees et al., 2012). This suggests that other mechanisms play a part in how support perceptions are formed. This research demonstrates that the unique relationship shared between an athlete and their coach is in large part responsible for the way in which athletes perceive social support. This thesis provides an explanation for discrepancies in research examining perceived support. Previous studies aimed at increasing perceived support have found that such interventions have proven to be unsuccessful, this may be caused by the support provider that was introduced was not perceived as supportive by the

perceiver. Any future research should consider the relationship between the support provider and perceiver when designing a study.

Unlike previous sport psychology research, this research was able to examine the links between perceived support and outcome variables at the three levels of analysis, enabling us to determine whether perceived support influences outcome variables differently if judgments reflect the perceiver, target or relational levels of analysis.

High levels of perceived support have been associated with a variety of performance related outcome variables. This thesis examined the effects of perceived support upon self-confidence, self-efficacy and positive and negative emotions, including anxiety, dejection, anger, happiness, excitement, self-confidence and self-efficacy using generalisability theory and qualitative research methods. Studies two and three showed that the association between perceived support and these variables was significantly influenced by the level of analysis. At the relational level of analysis, perceived support significantly correlated in a positive direction with positive emotions, self-confidence and self-efficacy, and in a negative direction with anxiety, anger and dejection. At the perceiver level of analysis perceived support significantly correlated in a positive direction with self-confidence, self-efficacy and positive emotions. Study two showed a significant correlation in a negative direction between perceived support and anger, anxiety and dejection. This suggests that higher levels of perceived support are associated with positive emotions, self-confidence and self-efficacy, implying that if interventions can increase an individual's level of perceived support, then perhaps these outcome variables can be increased.

Our results mirror those of Neely et al. (2006) who found that higher levels of perceived support were related to greater positive affect at the relational and perceiver levels of analysis.

This research can contribute to our understanding of how perceived support is related to performance-related outcome variables. Research like this can help social support models become more explicit about the kinds of social processes that are related to outcome variables.

The current research examined the effects of perceived support on performance related outcome variables including anxiety, anger, dejection, excitement, happiness, self-confidence and self-efficacy. Within sport psychology there has been some previous literature examining the effects of perceived support, however, these variables have never been investigated at the three levels of analysis, using generalisability analyses. Social psychology has, however, begun to investigate the links between perceived support and positive affect. Neely et al. (2006) found that higher levels of perceived support were related to greater positive affect at the perceiver and relationship levels of analysis. The current research mirrors these findings and demonstrated that perceived support has the potential to successfully increase positive emotions, self-confidence and self-efficacy. By understanding how perceived support influences these variables at the three levels of analysis researchers can design successful intervention strategies and conduct informed research.

This thesis has provided a better understanding of the antecedents of support, in regards to both the three components described by Lakey (2010): perceiver, target and relational, but also in the factors that influence these components. Studies two and three showed that the relational component was the most influential of the three in how an athlete perceives coaches

supportiveness. However, Study four provided information regarding how athletes view their coaches and how they form their judgement of support. Study four showed that athletes based their support judgements on previous experience, personality and familiarity with the coaches. Lakey (2010) stated that personality characteristics play a part in how support judgements are formed. This implies that future research may want to consider using personality inventories in order to investigate further the types of personalities which are viewed as more or less supportive.

Applied implications

The foremost conclusion from this thesis is that relational influences are the biggest determinant of an athlete's perceived supportiveness of their coach. This suggests that athletes will find specific coaches to be more supportive than other coaches and that there is the potential to pair specific athletes and coaches in order to create an unusually supportive relationship. This process of partnering a coach and an athlete has been described by researchers as 'optimal matching'. Veenstra et al, (2010) conducted a study in which support providers and support recipients were optimally matched. The study involved showing participants a video of different support providers before each of the participants had multiple conversations with each support provider. Their results showed that relational support could be predicted from recipient's affective responses to the perceived supportiveness of providers in response to a single ten minute conversation. If this were to be replicated in a sporting environment, unusually supportive coach-athlete relationships could be predicted. These unusually supportive relationships would have the potential to improve performance, increase self-confidence, self-efficacy and positive emotions, whilst reducing negative emotions.

A potential weakness of this approach however, may be that a team of multiple players could be optimally matched with a large number of different coaches; this may present a logistical problem. It may not be practical for a team of eleven players to have eleven coaches. Therefore, a small contingency of coaches may be of benefit so as to increase the possibility that an optimal supportive coach-athlete relationship could be formed. Given that having a large selection of coaches may not be viable, another approach would be to encourage coaches to change their behaviours in response to different athletes. Coaches would need to determine what their athletes require and be able to adapt their behaviours accordingly. However, further research is required in order to gain an understanding of how different coaching behaviours influence an athlete's perceptions of support.

Previous research has shown there to be discrepancies in the outcomes of support interventions. Uchino (2004) explains that these inconsistencies may be due to the varying approaches and orientations of the intervention studies. For example, Gottlieb (1988) identified that interventions can be categorized along two dimensions: firstly, whether the intervention is aimed at a newly formed relationship or an established relationship with a pre-existing support provider. The second dimension regards the unit of support, whether the intervention is to be conducted in a one-on-one environment or a group setting. The first dimension relates to the findings from this thesis. This research has demonstrated that perceived levels of support are significantly influenced by the relationship between the support provider and the perceiver, thus, interventions aiming to increase levels of perceived support by introducing a new support provider may not be successful. Similarly, interventions aimed at increasing the perceived supportiveness of a pre-existing support provider may not be

effective as the perceiver may not view that specific provider as particularly supportive, regardless of the provider's behaviours. The second dimension can also be linked to this thesis; Study one involved a one-on-one support intervention; results showed that not all participants identified the supportive behaviours of the provider. Studies three and four were conducted in a group environment, participants were able to report the supportiveness of the coaches they worked with. According to the findings of studies two, three and four this is due to the relational component being such an influential factor on the perceived supportiveness of coaches, however, the different approaches of the studies may also be a factor that plays a part in their discrepancies. Findings from this thesis suggest that in order to further our understanding of interventions and perceived social support, researchers should aim to improve the consistency of their approaches and provide much consideration to the support provider. This research implies that interventions will not be successful with just any support provider, thus, invalidating any research findings.

Limitations

It should be noted that there are several limitations of this research. Firstly, the concept of generalisability should be addressed. Study one involved a cognitive working memory task that targeted specific regions of the brain. Therefore, there may be a lack of generalisability regarding the findings. The results may not be applicable to sporting or even social situations. Studies two and three examined team and individual sports; however, the studies utilised differing approaches. Study two asked athletes to rate the perceived supportiveness of famous coaches they had not worked with; this may raise concerns over how the results can be generalised to the perceived supportiveness of coaches directly working with athletes. Studies three and four

examined martial artists' perceived supportiveness of coaches in a naturalistic, training environment. However, martial arts are an individual sport with a very distinct culture, thus posing concerns regarding generalisability. A second limitation that should be considered is the sample sizes used throughout the studies. Each of the studies used relatively small sample sizes. Despite previous researchers (see Lakey, 2010) expressing that multivariate generalisability analyses may be conducted with varying sample sizes, for example four support providers, eighty participants (Lakey, et al., 2004) or three providers and sixty-seven participants (Lakey & Scoboria, 2005), when compared with other quantitative research these sample sizes may be considered small.

A third limitation of the research is that athletes were asked to rate the supportiveness of five coaches that were not their normal coaches. These coaches may not have been a part of the athlete's social support network, and thus may not be viewed as a significant support provider. It may be beneficial to examine the perceived supportiveness of the support providers identified by the athletes themselves.

Studies two and three investigated the effects of perceived support upon performance related outcome variables including: self-confidence, self-efficacy and positive and negative emotions. Despite the results showing that perceived support significantly correlated with self-confidence, self-efficacy and positive emotions in a positive direction, due to them being measured simultaneously, the direction of causality remains unclear. High levels of perceived support may lead to an increase in performance related outcome variables such as self-confidence, or, high levels of self-confidence may lead to increased levels of

perceived support. Further research is required in order to ascertain the direction of causality.

Future research

In order to improve the generalisability of the findings from this thesis, future research should be conducted examining an athlete's perceived supportiveness of their coach in a range of sports including both team and individual. Athletes could be asked to rate the supportiveness of coaches on a multi-sports camp or by asking a larger sample size of mixed sports athletes to rate the supportiveness of their own coaches. Further research into both team and individual sport would increase validity and reliability of the findings

Future research should explore the concept of 'optimal matching'. Based upon the findings of the current and previous research, it is clear that the relational component significantly influences the perceived supportiveness of a support provider, thus, researchers should aim to repeat the study conducted by Veenstra et al. (2011) in order to establish if 'optimal matching' can be achieved in a sporting context. This research would enable athletes and coaches to be matched, producing an unusually supportive relationship. In addition to investigating 'optimal matching' studies should be conducted examining whether coaching behaviours can be manipulated in order to increase the perceived supportiveness of the coaches by their athletes. Interventions could be instigated in which coaches alter their behaviours and athletes rate the supportiveness of the coach based on these behaviours. Research into both coaching behaviours and optimal matching would provide information that may be used within coaching programmes in order to increase athletes' levels of perceived support.

Another approach would be to use varying interview techniques. According to Uchino (2009) a life span approach that considers the antecedent processes underlying social support should be utilised. An approach such as this could provide information regarding early familial processes which have appeared to affect perceived support (Graves, Want, Mead, Johnson, & Klag, 1998). Social support needs change throughout life therefore this approach may be able to provide an insight into the social support perceptions of an individual throughout any developmental changes. Furthermore, this may provide an understanding of how previous experiences, as identified in Study four influence current or future perceptions of support.

Although this thesis has gone some way in identifying how individuals judge the supportiveness of support providers, it has not fully identified the information used by recipients to judge a support provider. Future research should examine this information in order to explore the notion of producing a measure which could be distributed to athletes in order to identify which coaches they could be 'optimally' matched with.

Conclusion

This thesis examined the mechanisms underpinning social support in an achievement context. By using generalisability theory and qualitative research methods, this thesis demonstrates that the relational component has the largest influence on an athlete's perceived supportiveness of their coach. This implies that the relationship between the coach and the athlete plays an integral part in an athlete's levels of perceived support. Succeeding the relational component, the perceiver component was the second largest influence on an athlete's perceived supportiveness of their coach; implying that an athlete's personality and trait characteristics also play a part in the perception of coach

supportiveness. This thesis displays how perceived support is positively correlated with performance related outcome variables including self-confidence, self-efficacy and positive emotions. It also showed that perceived support is negatively correlated with negative emotions. This thesis provides a deeper understanding of the information used by athletes to form their perception of a coach's supportiveness and identifies direction for future research.

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APPENDICES

Appendix A: Revised 12-item social provisions scale (Cutrona & Russell, 1984; Lakey, McCabe, Fisicaro & Drew, 1996)

Firstly, please fill out the information about yourself below to enable us to contact you in the future regarding this study.

Name:

Email:

Age:
circle)

Gender: Male Female (Please

All information provided will remain confidential. Please answer every question. Thank you. Please answer all questions. If you are unsure about something, put what you think is as reasonable an answer as you can, given the question. There are no right or wrong answers. We are interested in all responses. Please check you have answered every question. If even one question has not been answered we cannot use your data.

In answering the following questions, think about your current relationships with friends, family members, other students, co-workers, and so on. Please indicate in the right hand column to what extent each statement describes your current relationships with other people. Use the following scale to indicate your opinion:

1

2

3

4

5

Strongly Disagree Disagree Uncertain Agree Strongly Agree

There are people I can depend on to help me if I really need it	
There is no one I can turn to for guidance in times of stress	
There are people who enjoy the same social activities I do	
I feel personally responsible for the well-being of another person	
I do not think other people respect my skills and abilities	
If something went wrong, no one would come to my assistance	
I have close relationships that provide me with a sense of emotional security and well-being	
I have relationships where my competence and skill are recognized	
There is no one who shares my interests and concerns	
There is no one who really relies on me for their well-being	
There is a trustworthy person I could turn to for advice if I were having problems	
I feel a strong emotional bond with at least one other person	

PLEASE TURN OVER

Below is a list of items referring to the types of help and support you may have available to you as a sportsperson. Please indicate to what extent you perceive the following types of support to be generally available to you . . .

Please use the following scale

1 = not at all

2

3 = somewhat

4

5 = a lot

To what extent do you have someone who . . .

1.	Talks things through with you	1	2	3	4	5
2.	Helps you with tasks during training and/or a performance	1	2	3	4	5
3.	Gives you technical and/or tactical advice	1	2	3	4	5
4.	Helps set sessions in training	1	2	3	4	5
5.	Is always there for you	1	2	3	4	5
6.	Sorts out practical matters for you	1	2	3	4	5
7.	Gives you constructive criticism	1	2	3	4	5
8.	Helps you plan your training	1	2	3	4	5
9.	Listens to your concerns	1	2	3	4	5
10.	Boosts your confidence	1	2	3	4	5
11.	Believes in you	1	2	3	4	5
12.	Gives you advice about coping with competitive situations	1	2	3	4	5
13.	Gives you moral support	1	2	3	4	5
14.	Tells you, you can do it	1	2	3	4	5
15.	Helps put things in perspective	1	2	3	4	5
16.	Reinforces the positives when dealing with doubts about current form	1	2	3	4	5
17.	Cheers you up	1	2	3	4	5
18.	Encourages you	1	2	3	4	5
19.	Helps you mentally prepare	1	2	3	4	5
20.	Helps with tasks to leave you free to concentrate	1	2	3	4	5

Thank you!

Appendix B: Protocol

The researcher will meet the participant at the entrance to the fMRI building.

The researcher will introduce themselves and take the participant into the waiting room.

The researcher will explain that the participant is required to complete a medical safety checklist and consent form for the Peninsular Medical School and ask them to complete it. The researcher and the fMRI associate will then check the answers to ensure that the participant is safe to enter the scanner and participate in the study. The researcher will then check that they have no metal on them e.g. piercings or under-wired bras.

The researcher will then read the script to the participant.

The participant will then be asked to complete the questionnaire booklet containing measures of self-efficacy (Bandura, 1997), emotions (PANAS, Watson, Clark, & Tellegen, 1988), stress appraisal (SAM, Peacock & Wong, 1990) and social support (Social provisions scale, Cutrona and Russell, 1984; Lakey, McCabe Fisicaro & Drew, 1996).

The participant will then be taken into the scanner room by the researcher and fMRI associate. They will then be set up in the scanner. The participant will be asked if they are comfortable and will be given the hand held controllers with the buttons for the task. They will also be given a panic button, which will be positioned next to their body. Participants will be reminded that should they need to exit the scanner they should press the panic button and the researcher and fMRI associate will immediately come and remove them from the scanner.

The researcher will repeat instructions regarding which buttons to use, reminding them to ignore the blue and red buttons. They will then be moved into

the scanner. The researcher and fMRI associate will then check that the participant can see the screen easily.

The researcher and fMRI associate will then leave the room.

Via the intercom, the researcher will remind the control group that they cannot ask for any advice regarding the task, and the manipulation group that they can ask for advice or support during the task. They will then be told that the practice is about to begin. The practice session will then run which presents an example and provides a practice run for each of the n-back tasks. The practice lasts five minutes.

The researcher will tell the participant when the task is about to begin and that instructions will appear on the screen. Each n-back task has three trials.

Between each trial a message will appear stating how many trials of that particular task are left. Instructions will appear between each different task reminding the participant how to complete the task.

Once the participant has completed the task they will be informed via the intercom that the task is over.

They will then be removed from the scanner and asked to wait in the waiting room.

The participant will be asked to complete the thought occurrence questionnaire for sport (TOQS, Hatzigeorgiadis & Biddle, 2000) which will also include a manipulation check.

The researcher will thank the participant for taking part and inform them that they will be contacted regarding the prizes once all participants had completed the task.

The researcher will then show the participant out and remind them not to discuss the task with other any other participants.

Appendix C: fMRI non-support group script

Hello and thank you for agreeing to participate in our research. In a minute we are going to ask you to perform a cognitive task in an fMRI scanner.

For this task, you will need to indicate whether the current target letter shown to you on a screen is the same as another specified letter. You will hold a remote in each hand; in your right hand the remote will have a green and red button, you need to press the green button if the letter is the correct letter. The remote in your left hand will have a blue button and a yellow button; you should press the yellow button if the letter is incorrect. For the purpose of this task you can ignore the red and blue buttons. There will be three versions of the task.

The first is called a one-back task. Letters will appear on a screen and you need to indicate whether they are the same as the previous letter. (Green = current letter the same as the previous, yellow= current letter not the same as previous letter). The second task is similar, however this time you are looking to indicate whether the current letter on the screen is the same as that which was previous to the last letter, for example B A B, the current letter is the same as the letter previous to the last letter making this correct (Green), C A D, the current letter is not the same as the letter previous to the last letter therefore it is not correct (Yellow). The third task is again similar however you need to indicate if the current letter is the same as that which is three letters back, e.g., B A C B, the current letter is the same as the third letter previous therefore this is correct (green). C A D B, the current letter is not the same therefore it is incorrect (Yellow).

The task will be scored by computer software, the person with the highest score across all three tasks will win £40, second place will win £20, third

place will win £10, and fourth place will win £5. We ask that you take the task seriously and complete it to the best of your ability.

Please note that you will not be able to ask for help during the task. In the case of an emergency there is a panic button and an intercom in which you can make contact with us.

Before we take you through to the scanner please fill out these forms. Two of them are safety forms to ensure your safety. The others contain a few short questions.

I would just like to remind you that you will not receive any help or advice during the task.

Appendix D: fMRI Manipulation group script

Hello and thank you for agreeing to participate in our research. In a minute we are going to ask you to perform a cognitive task.

For this task, you will need to indicate whether the current target letter shown to you on a screen is the same as another specified letter. You will hold a remote in each hand; in your right hand the remote will have a green and red button, you need to press the green button if the letter is the correct letter. The remote in your left hand will have a blue button and a yellow button; you should press the yellow button if the letter is incorrect. For the purpose of this task you can ignore the red and blue buttons. There will be three versions of the task. The first is called a one-back task. Letters will appear on a screen and you need to indicate whether they are the same as the previous letter. (Green = current letter the same as the previous, yellow= current letter not the same as previous letter). The second task is similar, however this time you are looking to indicate whether the current letter on the screen is the same as that which was previous to the last letter, for example B A B, the current letter is the same as the letter previous to the last letter making this correct (Green), C A D, the current letter is not the same as the letter previous to the last letter therefore it is not correct (Yellow). The third task is again similar however you need to indicate if the current letter is the same as that which is three letters back, e.g., B A C B, the current letter is the same as the third letter previous therefore this is correct (green). C A D B, the current letter is not the same therefore it is incorrect (Yellow).

The task will be scored by computer software, the person with the highest score across all three tasks will win £40, second place will win £20, third place will win £10, and fourth place will win £5. We ask that you take the task seriously and complete it to the best of your ability.

As a university of Exeter student you are a very intelligent and capable individual and we are very confident that you will perform well. You will be able to talk to us via an intercom throughout the task so please feel free to ask any questions at any time. We will be happy to provide advice and feedback if you wish, and we will be happy to discuss any questions or concerns that you may have now, during the task, or afterwards. In the case of an emergency there is a panic button and an intercom in which you can make contact with us.

Before we take you through to the scanner please fill out these forms. Two of them are safety forms to ensure your safety. The others contain a few short questions.

Appendix E: Participant information sheet

Dear Participant,

Thank-you for agreeing to take part in the current study. The following will explain what will be asked of you and what you should expect. Having completed the previous questionnaire, you have been selected to complete a cognitive task whilst being inside an fMRI scanner. The task is called an n-back task – specific detail of which will be explained in a moment. After the scan has been completed you will be required to fill out a final questionnaire.

fMRI is a method for producing images of the activity in the brain as people carry out various mental tasks. It involves placing the participant inside a large, powerful magnet, which forms part of the brain scanner. When particular regions of the brain are active, they require more oxygen, which comes from red corpuscles in the blood. As a result, the flow of blood increases. This can be detected as changes in the echoes from brief pulses of radio waves. These changes can then be converted by a computer into 3D images. This enables us to determine which parts of the brain are active during different tasks. As far as we know, this procedure poses no direct health risks. However, the Department of Health advises that certain people should NOT be scanned. Because the scanner magnet is very powerful, it can interfere with heart pacemakers and clips or other metal items, which have been implanted into the body by a surgeon, or, with body-piercing items. If you have had surgery, which may have involved the use of metal items, you should NOT take part. Note that only ferromagnetic materials (e.g. steel) are likely to cause significant problems. Thus normal dental amalgam fillings do not prohibit you from being scanned, though a dental plate, which contained metal, would do so, and you would be

asked to remove it. You will be asked to remove metal from your pockets (coins, keys), remove articles of clothing which have metal fasteners (belts, bras, etc), as well as most jewellery. Alternative clothing will be provided as necessary.

Watches and credit cards should not be taken into the scanner since it can interfere with their operation. You will be asked to complete a questionnaire (the Screening Form), which asks about these and other matters to determine whether it is safe for you to be scanned. You will also be asked to complete a consent form immediately before the scan. To be scanned, you would lie on your back on a narrow bed on runners, on which you would be moved until your head was inside the magnet. This is rather like having your head put inside the drum of a very large front-loading washing machine. The scanning process itself creates intermittent loud noises, and you would wear earplugs or sound-attenuating headphones. We would be able to talk to you while you are in the scanner through an intercom. If you are likely to become very uneasy in this relatively confined space (suffer from claustrophobia), you should NOT take part in the study. If you do take part and this happens, you will be able to alert the experimenters by activating an alarm and will then be removed from the scanner quickly. It is important that you keep your head or part of the body being scanned as still as possible during the scan (unless otherwise instructed) and to help you with this, your head will be partially restrained with padded headrests. We shall ask you to relax your head and keep it still for a period that depends on the experiment but may be more than one hour, which may require some effort on your part. If this becomes unacceptably difficult or uncomfortable, you may demand to be removed from the scanner. You may be asked to look at a screen through a small mirror (or other optical device) placed just above your eyes and/or be asked to listen to sounds through headphones.

You may be asked to make judgements about what you see or asked to perform some other kind of mental task. Details of the specific experiment in which you are invited to participate will either be appended to this sheet or else given to you verbally by the experimenter. Detailed instructions will be given just before the scan, and from time to time during it. The whole procedure will typically take about 1 hour. You will be able to say that you wish to stop the testing and leave at any time, without giving a reason. This would not affect your relationship with the experimenters in any way. The study will not benefit you directly, and does not form part of any medical diagnosis or treatment. If you agree to participate you will be asked to sign the screening form that accompanies this information sheet, in the presence of the experimenter (or other witness, who should countersign the form giving their name and address, if this is not practical). It is perfectly in order for you to take time to consider whether to participate, or discuss the study with other people, before signing. After signing, you will still have the right to withdraw at any time before or during the experiment, without giving a reason. The images of your brain will be held securely and you will not be identified by name in any publications that might arise from the study. The information in the screening form will also be treated as strictly confidential and the forms will be held securely until eventually destroyed. Further information about the specific study in which you are invited to participate may have been appended overleaf, if the experimenter has felt that this would be helpful. Otherwise, he/she will already have told you about the study and will give full instructions prior to the scan. Please feel free to ask any questions about any aspect of the study or the scanning procedure before completing the screening form.

Appendix F: fMRI Consent form

RESEARCH CONSENT FORM FOR MRI SCANNING

The participant should complete the whole of this sheet himself/herself.

Have you read the Information Sheet? Yes No

Have you had the opportunity to ask questions and discuss this study? Yes No

Have you received satisfactory answers to all of your questions? Yes No

Have you received enough information about the study? Yes No

Who has explained the procedure and study to you (write name)?

**Do you understand that you are free to withdraw from the study at any time
without having to give a reason?**

Yes No

Do you agree to take part in this study? Yes No

All the personal information we are going to ask you is required to determine whether it is safe and suitable for you to undergo an MRI scan. This information will be kept separately from your scan and once the scan is complete the scan data be referred anonymously. We will not pass on your personal information to third parties.

The consent form you have signed indicates that you have agreed for your scan data to be used for the study you have been recruited for. However, your scan data can form part of a substantial resource that we can draw on in the future, for example for teaching or further scientific studies. We would like to ask you to consider giving additional consent for your data to be used anonymously in this way.

This consent is entirely optional. Answering "No" to the following questions will not affect whether you can take part in the study for which you have been recruited.

I consent for my scan data to be used for education purposes Yes No

I consent for my scan data to be used in further scientific studies Yes No

NAME IN BLOCK LETTERS:

Signed: Date:

NAME OF RESEARCHER:

Signed:

Appendix G: Safety checklist

Name:

Date of Birth:

Weight:

Name of Study/Volunteer Number:

Please check the following list carefully, answering all appropriate questions.

Please do not hesitate to ask staff, if you have any queries regarding these questions.

1. Do you have a pacemaker, artificial heart valve or coronary stent?

Yes/No

2. Have you ever had major surgery?

Yes/No

If yes, please give brief details.

3. Do you have any aneurysm clips (clips put around blood vessels during surgery)?

Yes/No

4. Do you have any implants in your body:

Yes No Joint replacements, pins or wires

Yes No Implanted cardiovascular defibrillator (ICD)

Yes No Electronic implant or device

Yes No Magnetically-activated implant or device

Yes No Neurostimulation system

Yes No Spinal cord stimulator

Yes No Insulin or infusion pump

Yes No Implanted drug infusion pump

Yes No Internal electrodes or wires

Yes No Bone growth/bone fusion stimulator

Yes No Any type of prosthesis

Yes No Heart valve prosthesis

Yes No Eyelid spring or wire

Yes No Metallic stent, filter or coil

Yes No Shunt (spinal or intraventricular)

Yes No Vascular access port and/or catheter

Yes No Wire mesh implant

Yes No Bone/joint pin, screw, nail, wire, plate etc.

Yes No Other Implant.....

5. Do you have an artificial limb, calliper or surgical corset? Yes/No
6. Do you have any shrapnel or metal fragments, for example from working in a machine tool shop? Yes/No
7. Do you have a cochlear implant? Yes/No
8. Do you wear dentures, plate or a hearing aid? Yes/No
9. Are you wearing a skin patch (e.g. anti-smoking medication), have any tattoos, body piercing, permanent makeup or coloured contact lenses? Yes/No
10. Are you aware of any metal objects present within or about your body, other than those described above? Yes/No
11. Are you susceptible to claustrophobia? Yes/N
o
12. Do you suffer from blackout, diabetes, epilepsy or fits? Yes/No

For women:

1. Are you pregnant or experiencing a late menstrual period? Yes/No
2. Do you have an intra-uterine contraceptive device fitted? Yes/No
3. Are you taking any type of fertility medication or having fertility treatment? Yes/No

Important Instructions

Remove all metallic objects before entering the scanner room including hearing aids, mobile phones, keys, glasses, hair pins, jewellery, watches, safety pins, paperclips, credit cards, magnetic strip cards, coins, pens, pocket knives, nail clippers, steel-toed boots/shoes and all tools. Loose metallic objects are especially prohibited within the MR environment.

I have understood the above questions and have marked the answers correctly.

Signature

Date

(Participant/Parent/Guardian)

MR Centre Staff Signature

Appendix H: Questionnaire booklet

Name:

In answering the following questions, think about your current relationships with friends, family members, co-workers, community members, and so on. Please indicate to what extent each statement describes your current relationships with other people. Use the following scale to indicate your opinion:

1

2

3

4

5

Strongly Disagree

Disagree

Uncertain

Agree

Strongly Agree

1. There are people I can depend on to help me if I really need it. _____
2. There is no one I can turn to for guidance in times of stress. _____
3. There are people who enjoy the same social activities I do. _____
4. I feel personally responsible for the well-being of another person. _____
5. I do not think other people respect my skills and abilities. _____
6. If something went wrong, no one would come to my assistance. _____
7. I have close relationships that provide me with a sense of emotional security and well-being. _____
8. I have relationships where my competence and skill are recognized. _____
9. There is no one who shares my interests and concerns. _____
10. There is no one who really relies on me for their well-being. _____
11. There is a trustworthy person I could turn to for advice if I were having problems. _____
12. I feel a strong emotional bond with at least one other person. _____

Below are a number of words that describe different feelings and emotions.

Read each word and then in the box next to the word, insert a number from 1 to 5 to indicate to what extent you feel this way right now, i.e. at the present moment.

1

2

3

4

5

Very slightly or
not at all

A little

Moderately

Quite a bit

Extremely

1. Interested _____
2. Disinterested _____
3. Excited _____
4. Upset _____
5. Strong _____
6. Guilty _____
7. Scared _____
8. Hostile _____
9. Enthusiastic _____
10. Proud _____
11. Irritable _____
12. Alert _____
13. Ashamed _____
14. Inspired _____
15. Nervous _____
16. Determined _____
17. Attentive _____
18. Jittery _____
19. Active _____
20. Afraid _____

The following questions are concerned with your thoughts and feelings about various aspects of the upcoming task. Please respond according to how you view the task. If you

are unsure about something, put what you think is as reasonable an answer as you can, given the question. Please answer all questions by writing the appropriate number corresponding to the following scale.

1	2	3	4	5
Not at all	Slightly	Moderately	Considerably	Extremely

1. Is this a totally hopeless situation? _____
2. Does this task create tension in me? _____
3. Is the outcome of this task uncontrollable by anyone? _____
4. Is there someone I can turn to for help if I need it? _____
5. Does this task make me feel anxious? _____
6. Does this task have important consequences for me? _____
7. Is this task going to have a positive impact on me? _____
8. How eager am I to perform this task? _____
9. How much will I be affected by the outcome of this task? _____
10. To what extent can I become a stronger person because of this task? _____
11. Will the outcome of this task be negative? _____
12. Do I have the ability to do well at this task? _____
13. Does this task have serious implications for me? _____
14. Do I have what it takes to go well in this task? _____
15. Is there help available to me to be successful in this task? _____
16. Does this task tax or exceed my coping resources _____
17. Are there sufficient resources available to help me to be successful in this task? _____
18. Is it beyond anyone's power to do anything about this task? _____
19. To what extent am I excited thinking about the outcome of this task? _____
20. How threatening is this task? _____
21. Is the outcome of this task outside anyone's control? _____
22. Will I be able to perform well in this task? _____
23. Is there anyone who can help me be successful in this task? _____
24. To what extent do I perceive this task as stressful? _____
25. Do I have the necessary skills to achieve a successful outcome in this task? _____
26. To what extent does this task require coping efforts on my part? _____
27. Does this task have long-term consequences for me? _____
28. Is this task going to have a negative impact on me? _____

Now, think about your performance at each of the levels on the upcoming cognitive task. In the column CAN YOU ACHIEVE IT, state Yes or No for each band of scores with reference to whether you believe you can achieve a percentage score equal to or above the band of scores. For those scores that you stated Yes to, in the adjacent column, labelled CONFIDENCE, rate how confident you are that you can achieve those scores. Rate your degree of confidence by recording a number from 0 to 100 using the scale given below.

A horizontal scale from 0 to 100 with labels 'cannot do at all' at 0, 'Moderately certain can do' at 50, and 'Certain can do' at 100.

One-back task

Can you achieve it?

Confidence

Yes/No

(0-

100)

I can identify 1-10% of the targets correctly

—

I can identify 11-20% of the targets correctly

I can identify 21-30% of the targets correctly

—

I can identify 31-40% of the targets correctly

I can identify 41-50% of the targets correctly

I can identify 51-60% of the targets correctly

I can identify 61-70% of the targets correctly

—

I can identify 71-80% of the targets correctly _____

I can identify 81-90% of the targets correctly _____

I can identify 91-100% of the targets correctly _____

Two-back task

Can you achieve it?

Confidence

Yes/No (0-
100)

I can identify 1-10% of the targets correctly _____

I can identify 11-20% of the targets correctly _____

I can identify 21-30% of the targets correctly _____

I can identify 31-40% of the targets correctly _____

I can identify 41-50% of the targets correctly _____

I can identify 51-60% of the targets correctly _____

I can identify 61-70% of the targets correctly _____

I can identify 71-80% of the targets correctly _____

I can identify 81-90% of the targets correctly _____

I can identify 91-100% of the targets correctly _____

Three-back task

Can you achieve it?

Confidence

Yes/No (0-100)

- | | | |
|---|-------|-------|
| I can identify 1-10% of the targets correctly | _____ | _____ |
| I can identify 11-20% of the targets correctly | _____ | _____ |
| I can identify 21-30% of the targets correctly | _____ | _____ |
| I can identify 31-40% of the targets correctly | _____ | _____ |
| I can identify 41-50% of the targets correctly | _____ | _____ |
| I can identify 51-60% of the targets correctly | _____ | _____ |
| I can identify 61-70% of the targets correctly | _____ | _____ |
| I can identify 71-80% of the targets correctly | _____ | _____ |
| I can identify 81-90% of the targets correctly | _____ | _____ |
| I can identify 91-100% of the targets correctly | _____ | _____ |

Thank you for answering these questions.

Appendix I: Thought occurrence questionnaire for sport

Reflecting on the task you just performed, please fill out the items overleaf, which ask about certain thoughts that you might have had during the task. For each item there are three answer columns. Having read the question, please rate in column 1, how frequently you experienced that thought (on a scale from 1 = never to 7 = very often). In column 2, rate how distracting these thoughts were (on a scale from 1 = not at all to 7 = very distracting). In column 3, rate how this affected the amount of effort you put into completing the task (on a scale from -3 = made me give up trying, though 0 = neutral, to 3 = made me try harder).

Item	Frequency (1=never, 7 = very often)	Distraction (1=not at all, 7=very distracting)	Effort (-3=made me give up trying, 0=neutral, 3=made me try harder)
1. During the task I had thoughts that I want to quit.			
2. During the task I had thoughts about other activities (e.g. shopping, having tea, TV)			
3. During the task I had thoughts about previous mistakes I have made			
4. During the task I had thoughts that I do not want to take part in this task anymore			
5. During the task I had thoughts about what I'm going to do later in the day			
6. During the task I had thoughts that I'm having a bad day			
7. During the task I had thoughts that I want to get out of here			
8. During the task I had thoughts about personal worries (e.g. work, relationships)			
9. During the task I had thoughts that the equipment is not good			
10. During the task I had thoughts about stopping			
11. During the task I had thoughts about friends			

12. During the task I had thoughts that I am not going to do as well as I would like			
13. During the task I had thoughts that I am fed up with it			
14. During the task I had thoughts about what I am going to do when I get home			
15. During the task I had thoughts that I am not going to perform as well as others			
16. During the task I had thoughts that I cannot stand it anymore			
17. During the task I had thoughts that the other participants are better than me			

Appendix J: Study 2 Informed consent form



School of Sport and Health Sciences

INFORMED CONSENT

Project Title: The information used by rugby players to judge coach supportiveness depends on the perceptions of the players, the objective characteristics of the coach and their unique relationship.

Researcher: Francesca Gwynne

The purpose of this study has been clearly explained to me and any risks involved in my participation have been made explicitly clear. All my questions about it have been satisfactorily answered. In addition, I agree that:

- Information I give will only be used for completion of a study within Sport and Health Sciences, University of Exeter and in publications resulting from the study.
- My identity in this study will remain anonymous.
- I have the right to withdraw any of my statements. I am also free to withdraw from the study at any time.
- Any data I provide will be stored securely. Questionnaires will have names removed, and will be stored in a lockable cabinet. Only the study supervisor and the researcher will have access to these data.
- I have a right to request to see the questionnaires to make changes.

Date:

Participant:

Researcher:

Appendix K: Study 3 Informed consent form



School of Sport and Health Sciences

INFORMED CONSENT

Project Title: The information used by athletes to judge supportiveness of their coaches depends on whether the judgement reflects the personality of the athlete, the objective characteristics of the coaches, or the unique coach-athlete relationship.

Researcher: Francesca Gwynne

The purpose of this study has been clearly explained to me and any risks involved in my participation have been made explicitly clear. All my questions about it have been satisfactorily answered. In addition, I agree that:

- Information I give will only be used for a completion of a dissertation at the School of Sport and Health Sciences, University of Exeter and publications resulting from the dissertation.
- My identity in this study will remain anonymous.
- I have the right to withdraw any of my statements. I am also free to withdraw from the interview.
- My data will be stored securely. The interview tapes and the transcripts will be stored in a lockable cabinet. Only the dissertation supervisor and the researcher will have access to these data.
- After the dissertation is completed the interview tapes will be destroyed.
- I have a right to request to see the interview transcripts to make changes. I also have the right to request to see the dissertation.

Date:

Signed:

Participant:

Researcher:

Appendix L: Study 2 Questionnaire

In this study, you will be asked to reflect on the support that you, as a rugby player, think you would receive from five rugby coaches. You will also be asked to rate your emotions and levels of confidence. The information you provide will be used only for the purpose of the research and you will not be identified individually. As such your confidentiality is assured – I am asking you to provide me with your name and contact details, so that I can email you about the results of the study, should you be interested. Please indicate (by circling a response) if you would like to be included in a group email about the study findings, which I will send out on completion of the study.

YES NO

Please take your time and answer all the questions. If you are unsure about something, put what you think is as reasonable an answer as you can, given the question. There are no right or wrong answers, and I am interested in all responses. **PLEASE, BEFORE YOU FINISH, CHECK ALL YOUR ANSWERS AND MAKE SURE EVERY QUESTION HAS BEEN ANSWERED.** If only one question has not been answered in this way, I cannot use your data.

Firstly, please fill out the information about yourself below.

Name: Age:

Email: Gender:

Nationality:

For how many years have you been playing rugby?

At what level do you currently play rugby? (Please circle your response)

School Youth

Adult Club County

Divisional Semi-Professional

Professional International

What is the highest level of rugby you have played? (Please circle your response)

School	Youth
Adult Club	County
Divisional	Semi-Professional
Professional	International

How many coaches have you worked with since you started rugby?

THANK YOU

Your Name:

Coach Picture & Name

Please answer the following questions in response to the coach shown above.

How would you rate your knowledge of the coach? (Please circle one option)

No knowledge of them (haven't heard of them)	A little knowledge of them (have heard of them but don't know anything about them)	A moderate knowledge of them (have heard of them and know a bit about them)	A detailed knowledge of them (know a lot about them and their career)
---	---	--	--

Below is a list of items referring to the types of help and support that coaches might make available to you. Please answer the list of items with regard to the above coach.
Please indicate to what extent you perceive the following types of support would be available to you if you were to work with this coach by circling one number.

Please use the following scale...

0 = not at all

1 = slightly

2 = moderately

3 = considerably

4 = extremely

To what extent do you feel the coach would . . . ?

1. Listen to your concerns	0	1	2	3	4
2. Give you constructive criticism	0	1	2	3	4
3. Reinforce the positives for you	0	1	2	3	4
4. Give you moral support	0	1	2	3	4
5. Provide you with guidance concerning possible solutions to a problem	0	1	2	3	4
6. Tell you, you can do it	0	1	2	3	4
7. Always be there for you	0	1	2	3	4
8. Give you critical advice	0	1	2	3	4
9. Instil you with confidence	0	1	2	3	4

Below you will find a list of words that describe a range of feelings that rugby players may experience. **Please read each one carefully and indicate how you would feel if you were to work with this coach by circling one number.** Do not spend too much time on any one item, but choose the answer which best describes your feelings if you were to work with this coach.

0 = not at all

1 = slightly

2 = moderately

3 = considerably

4 = extremely

1.	Uneasy	0	1	2	3	4
2.	Upset	0	1	2	3	4
3.	Exhilarated	0	1	2	3	4
4.	Irritated	0	1	2	3	4
5.	Pleased	0	1	2	3	4
6.	Tense	0	1	2	3	4
7.	Sad	0	1	2	3	4
8.	Excited	0	1	2	3	4
9.	Furious	0	1	2	3	4
10.	Joyful	0	1	2	3	4
11.	Nervous	0	1	2	3	4
12.	Unhappy	0	1	2	3	4
13.	Enthusiastic	0	1	2	3	4
14.	Annoyed	0	1	2	3	4
15.	Cheerful	0	1	2	3	4
16.	Apprehensive	0	1	2	3	4
17.	Disappointed	0	1	2	3	4
18.	Energetic	0	1	2	3	4
19.	Angry	0	1	2	3	4
20.	Happy	0	1	2	3	4
21.	Anxious	0	1	2	3	4
22.	Dejected	0	1	2	3	4

Please read each of the statements below and indicate (by circling one number), if you were to work with the above coach, how you would feel about any upcoming matches.

0 = not at all

1 = somewhat

2 = moderately

3 = very much so

- | | | | | |
|--|---|---|---|---|
| 1. I would be self-confident | 0 | 1 | 2 | 3 |
| 2. I would be confident I could meet the challenge | 0 | 1 | 2 | 3 |
| 3. I would be confident about performing well | 0 | 1 | 2 | 3 |
| 4. I would be confident because I could mentally picture myself reaching my goal | 0 | 1 | 2 | 3 |
| 5. I would be confident of coming through under pressure | 0 | 1 | 2 | 3 |
-

Please read each of the statements below and indicate (by circling one number, based upon the scale below), if you were to work with that coach, how confident would you be in your ability to . . . ,”

0 = not at all

1 = slightly

2 = moderately

3 = considerably

4 = extremely

1.	Tackle accurately and effectively	0	1	2	3	4
2.	Perform well even when your opposition has beaten you before	0	1	2	3	4
3.	Kick accurately and effectively	0	1	2	3	4
4.	Pass accurately and effectively	0	1	2	3	4
5.	Stay focused and ignore what's going on around you	0	1	2	3	4
6.	Perform to the best of your ability	0	1	2	3	4
7.	Perform well even when your opposition are ranked higher than you	0	1	2	3	4
8.	Perform your role well	0	1	2	3	4
9.	Continue to perform well even when it feels that every decision is going against you	0	1	2	3	4
10.	Perform well even when you're beginning to feel tired	0	1	2	3	4
11.	Perform set plays accurately and effectively	0	1	2	3	4
12.	Push yourself to train harder	0	1	2	3	4

Appendix M: Study 4 Participant information sheet



Contact details

Fg217@ex.ac.uk

Tel: 07795327655

Information sheet

Dear Participant,

Thank you for agreeing to take part in this study. The aim of this study is to gain an understanding of how athletes judge the supportiveness of their coaches. The results will highlight the key determinants of successful relationships between coaches and athletes and hopefully enable new guidelines to be developed in order to enhance coaching in the future. The study will involve an interview in which I will ask you a variety of questions about each of the coaches and about the answers you provided to the original questionnaires that you completed during your Tae Kwon-do summer camp. The questions will be aimed at how you perceived the coaches and how you think it would feel to work with them again. Please be reassured that ALL information you provide will remain strictly CONFIDENTIAL and used only for the purpose of productive research into the social support experienced among athletes. Please also be aware that your participation is completely voluntary and that you are free to refuse to take part or withdraw at any time. You may also refuse to answer any of the questions included. The transcripts from the interviews will be stored carefully to ensure privacy and every effort is taken to ensure that your welfare is protected. There is the possibility of a follow-up interview, however; I will contact you if this is required. If you have any questions please do not hesitate to ask.

Thank you.

Appendix N: Study 4 Informed Consent form



School of Sport and Health Sciences

INFORMED CONSENT

Project Title: A case study exploring athletes' judgements of their coaches

Researcher: Francesca Gwynne

The purpose of this study has been clearly explained to me and any risks involved in my participation have been made explicitly clear. All my questions about it have been satisfactorily answered. In addition, I agree that:

- Information I give will be used for the completion of a study at the School of Sport and Health Sciences, University of Exeter and publications resulting from the study.
- My identity in this study will remain anonymous.
- I have the right to withdraw any of my statements. I am also free to withdraw from the study at any time.
- Any data I provide will be stored securely. The interview tapes and the transcripts will be stored in a lockable cabinet. Only the study supervisor and the researcher will have access to these data.
- After the study is completed the interview tapes will be destroyed.
- I have a right to request to see the interview transcripts to make changes. I also have the right to request to see the study.

Date:

Participant:

Researcher:

Appendix O: Study 4 Interview Guide

Interview Guide

Phase 1 – demographic/descriptive

1. Please can you tell me a bit about yourself?
2. How/why did you get into Tae Kwon-do?
 - Family/friends etc?
3. How long have you been doing Tae Kwon-do?
4. Do your friends/family encourage you?
5. What made you want to go to summer camp?

Phase 2 – Data specific

1. If you were to work with coach A/B/C/D/E again, how supportive do you think they would be?
 - What would they do that was supportive?
 - Would they do anything that was particularly unsupportive?
 - Listen to you?
 - Give you constructive criticism?
 - Be positive?
 - Moral support?
 - Provide you with guidance/solutions to problems?
 - Tell you, you can do it?
 - Always be there for you?
 - Give you critical advice?
 - Instil you with confidence?
2. Why do you feel that coach A/B/C/D/E would be more supportive than coach A/B/C/D/E?
 - What do they do that's more supportive?
 - Do they behave differently?
 - How do they act/respond to you?
3. How supportive you think other people would view these coaches?
 - Why would they view them this way?
4. Do you feel that you are more similar to coach A/B/C/D/E?
 - Do you feel that being similar/dissimilar to them is a good thing?
 - Do you think it makes them more supportive to you?
 - What do they do to make you feel this way?
5. When rating these coaches what do you think about?

- Previous experiences?
 - Similarities?
 - Personality? (openness to new experiences/ conscientiousness/ extraversion/ agreeableness/neuroticism)
 - Do you think the coaches act differently with different athletes?
 1. Agreeableness had been linked with high perceived social support.
 2. People who are neurotic themselves view others who are neurotic as more supportive.
 - Competency of the coach?
 - Compared to club coach?
6. What do you like about each of these coaches?
- Personalities?
 - Experience?
 - The way that they make you feel?
7. If you were to work with these coaches again, how would they make you feel?
- Happy (pleased. Joyful, cheerful)
 - Angry (Irritated, furious, annoyed)
 - Dejected (upset, sad, unhappy, disappointed)
 - Excited (exhilarated, enthusiastic, energetic)
 - Anxious (uneasy, tense, nervous, apprehensive)
 - Confident
 - Why?
 - What do they do to make you feel this way?
8. You stated that coach _ was more/less supportive, what effect does that support have on you?
- Happy
 - Angry
 - Dejected
 - Excited
 - Anxious
 - Confident

Phase 3 – Closing

9. What do you think makes a perfect supportive relationship between a coach and an athlete?
10. Do you think it's important for a coach to be supportive of their athlete?

11. Do you have anything else you'd like to discuss regarding these five coaches,
or any other coaching experiences you feel may be relevant?